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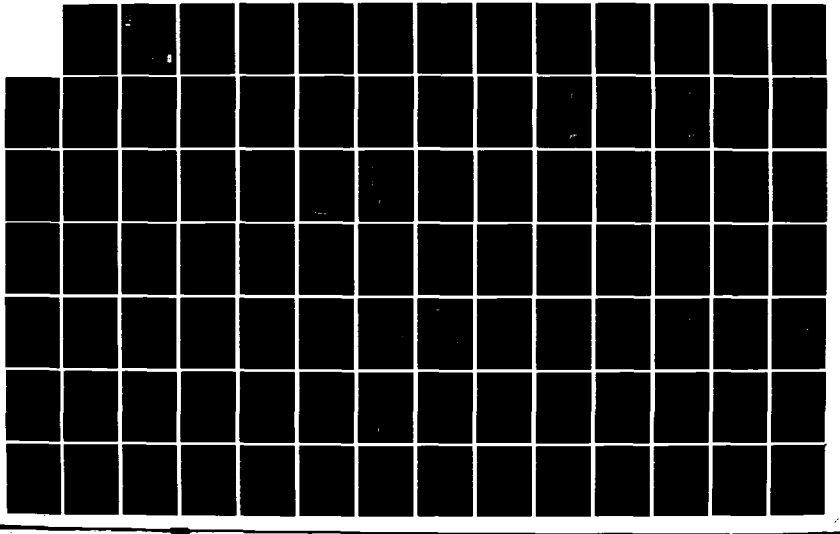

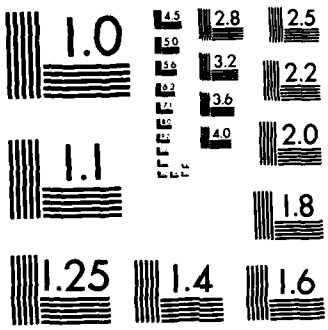

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INSTALLATION RESTORATION PROGRAM

PHASE I – RECORD SEARCH, HAZARDOUS MATERIALS DISPOSAL SITES

GRIFFISS AFB, NEW YORK

PREPARED FOR

UNITED STATES AIR FORCE
AFESC/DEV

Tyndall AFB, Florida

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JAN 2 4 1983
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JULY, 1981

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The identification of hazardous waste disposal sites at military installations was directed by Defense Environmental Quality Program Policy Memorandum 80-6. Phase I constitutes a records search to determine the potential, if any, for migration of toxic and hazardous materials off the installation as a result of past operations and disposal activities. The Griffiss AFB records search included a detailed review of pertinent installation records, contacts with various government and private agencies for documents

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relative to the search, and onsite visits. No direct evidence of off-base pollution migration was found. However, several sites were listed as potential contamination areas. It has been recommended that these areas recieve additional attention to determine if pollution migration exists.

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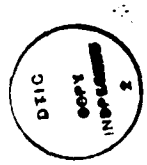

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EXECUTIVE SUMMARY

The Resource Conservation and Recovery Act of 1976 (RCRA) was promulgated to regulate the generation, transportation, treatment and disposal of hazardous wastes. Simultaneous to the passage of RCRA, the Department of Defense (DOD) devised a Comprehensive Installation Restoration Program (IRP) to identify, report and correct potential environmental deficiencies that could result in ground-water contamination and probable migration of contaminants beyond DOD installation boundaries. The IRP has been developed as a three phase program:

Phase I - Problem Identification/Records Search

Phase II - Problem Confirmation and Quantification

Phase III - Corrective Action

Engineering-Science (ES) was contracted to conduct Phase I of the IRP for Griffiss Air Force Base (AFB).

The on-site portion of Phase I was performed at Griffiss AFB April 27 through May 1, 1981. During this period formal interviews were conducted with key base personnel familiar with past waste disposal practices, and file searches were performed for identified facilities which have generated, handled, transported, and disposed of waste materials.

INSTALLATION DESCRIPTION

Griffiss Air Force Base is located in central New York State, approximately two miles northeast of the City of Rome, Oneida County, New York. The base proper covers approximately 3,900 acres and is situated in the broad, relatively flat valley of the Mohawk River. Besides the main base, there are 11 annexes that are part of the Griffiss Air Force Base facilities. Two of these annexes are dedicated to base support and the remaining 9 are utilized for research and development purposes by the Rome Air Development Center of the Air Force Systems Command.

ENVIRONMENTAL SETTING

Several environmentally sensitive conditions were noted at Griffiss Air Force Base which need to be considered when handling and disposing of hazardous waste materials. These are as follows:

1. The base is located within what must be regarded as a ground-water recharge zone. The topography of the area is generally flat, limiting runoff rates, and region soils are typically granular, favoring moderate infiltration rates. It is reasonable to expect pollutants mobilized by precipitation to ultimately percolate downward into local aquifers.
2. Hydrogeologic units identified at the site are located at or near ground surface and receive recharge directly from precipitation or stream flow.
3. The annual average total precipitation at the site is high (rainfall 45.6 inches, snowfall 107 inches, and evapotranspiration 23 inches).
4. Several wetland areas have been identified on the base.

PROCEDURES

A review of all waste generation sources at the base was conducted to determine past disposal methods for hazardous wastes. This review included 21 industrial shop areas, 8 research and development labs, pesticide and herbicide utilization, low level radioactive waste sources, fire control training area, hazardous waste storage areas and POL (Fuels Management) areas. Past and present waste materials were identified and the disposal methods used for each source was determined according to base records or assumptions that could be made. The seven disposal methods included on-site landfills (seven sites), industrial waste treatment facilities (11 gravity separators), dry wells, sanitary sewer discharging to the City of Rome Waste Water Treatment Plant, storm sewer, septic tanks, off-site hazardous waste contract disposal, and off-site non-hazardous waste contract disposal.

Nineteen disposal sites located on the GAFB property were identified as containing hazardous material resulting from past waste disposal activities. These sites have been assessed using a rating system which

takes into account factors such as site characteristics, waste characteristics, potential for contamination and waste management practices. The details of the rating procedure are presented in Appendix B and the results of the assessment are given in Table 1. Rating scores were developed for the individual sites and the sites are listed in order of ranking. The rating system is designed to indicate the relative need for more detailed site assessment and/or remedial action.

FINDINGS AND CONCLUSIONS

Based on the results of the project team's one-week field inspection, review of records and files, and interviews with base personnel, the following conclusions have been developed. The conclusions are listed by category.

1) Landfill Areas
   a) Landfill No. 1 creates the greatest potential for off-site migration of contaminants. Surface contamination by leachate from the landfill of Six Mile Creek has been identified and ground-water contamination may also be occurring.
   b) Other landfills (No.'s 2, 7, 5 and 6) may present potential contamination problems due to construction techniques used (no liner), location (wetland areas, permeable soils), unknown nature of waste materials (incomplete records).
2) Drywells
   a) Drywells at Buildings 117, 3, 301, 225, and 219 (ranked in descending priority) have been used to dispose of hazardous materials which may have resulted in ground-water contamination.
3) Spill Areas
   a) The Floyd PCB spill area, the Lindane spill area (former Entomology storage building) and the Building 112 PCB dump area exhibit a potential for contamination of ground water.
   b) The storage area for liquid hazardous waste (Lot 69) has had small spills in the past and does not provide containment (seepage), or security (no fence).
4) Water Wells
   a) On-base water wells could become contaminated by leachate production from the landfills.

TABLE 1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

Rank	Site Name	Site Evaluation Score %
1	Landfill No.1	81
2	Landfill No.2	75
3	Landfill No.7	68
4	Bulk Fuel Storage Area	58
5	Lindane Spill at Former Entomology Storage Bldg.	57
6	Yellow Submarine Holding Tank, Bldg. 101	56
7	Landfill No.5	55
8	PCB Dump Area, Bldg. 112	53
(9)	Landfill No.6	52
(9)	Drywell, Steam Plant, Bldg. 117	52
11	Drywell, Bldg. 3	51
12	Drywell, Entomology, Bldg. 301	50
13	Two Drywells, Bldg. 225	49
(14)	General Chlordane Application	46
(14)	Drywell, Bldg. 219	46
(14)	PCB Spill at Floyd	46
17	Hazardous Waste Storage Area, Lot 69	38
18	Waste Oil Storage Area, Bldg. 101	36
19	PCB Transformer Leak, Bldg. 112	32

Note: This ranking was performed according to the Hazard Evaluation Methodology described in Appendix B.

RECOMMENDATIONS

The following recommendations are made to further assess or prevent potential contaminant migration from waste disposal areas at Griffiss AFB.

Recommendations for Phase II

First Priority

1) Ground-water and surface water monitoring should be performed at Landfill No. 1. There should be a minimum of one well up-gradient and two wells down-gradient. At a minimum, Interim Primary Drinking Water Standards, Priority Pollutants and TOC analyses should be carried out.

Second Priority

1) It is recommended that ground-water and surface water monitoring be performed on Landfills No. 2 and 7 as well, with similar analyses being carried out.

Other Recommendations

1) Initiate temporary remedial measures for landfill closure at Landfill No. 1 and No. 2. Improve cover at both sites (grade to eliminate ponding, provide plant cover) and construct leachate collection sump for surface runoff at Landfill No. 1.
2) Discontinue the use of dry wells for disposal of hazardous material.
3) Sample soil from Building 112's PCB dump area and analyse for PCB concentration.
4) Perform periodic analyses (Interim Primary Drinking Water Standards and Priority Pollutants and TOC) on water produced by on-base water wells.

CHAPTER 1

INTRODUCTION

CHAPTER 1
INTRODUCTION

BACKGROUND

The discharge, disposal, or storage of solid wastes into or on the land surface is controlled by both state and Federal regulations. The prime objectives of these regulations are the protection of the public health and the environment, the development and implementation of solid waste management plans and the development of resource conservation and recovery programs. The key legislation governing the management and disposal of solid waste is the Resource Conservation and Recovery Act of 1976 (RCRA). The Act was promulgated to regulate the generation, transportation, treatment and disposal of hazardous wastes; regulate facilities for the disposal of all solid wastes; phase out the use of open dumps for disposal of solid wastes; and to promote the conservation of natural resources through the management, reuse or recovery of solid and hazardous waste. Regulations and implementation instructions of RCRA are still being developed by the U.S. Environmental Protection Agency (EPA).

Under RCRA Section 3012 (PL 96-482, October 21, 1980), each state is required to inventory all past and present hazardous waste disposal sites. Under Section 6003 of RCRA, Federal agencies are required to assist EPA and make available all requested information on past disposal practices. It is the intent of the Department of Defense (DOD) to comply fully with these as well as other requirements of RCRA.

AUTHORITY

Simultaneous with the passage of RCRA, the DOD devised a comprehensive Installation Restoration Program (IRP). The purpose of the IRP is to identify, report and correct potential environmental deficiencies that could result in ground-water contamination and probable migration of contaminants beyond the DOD installation boundaries. In response to

RCRA and in anticipation of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (Superfund), the DOD issued the directive DEPQPPM 80-6 requiring identification and quantification of hazardous waste disposal sites on DOD agency reservations and subsequently the implementation of remedial actions for any hazardous waste disposal problem which poses a health threat to the public.

PURPOSE AND SCOPE OF THE ASSESSMENT

The Installation Restoration Program has been developed as a three-phased program as follows:

Phase I - Problem Identification/Records Search

Phase II - Problem Confirmation and Quantification

Phase III - Corrective Action

The Problem Identification/Records Search phase (Phase I) is directed towards providing answers to the following questions:

1. What hazardous materials have been generated on the reservation?
2. How have the wastes been managed?
3. Was the waste management procedure adequate to immobilize, contain, treat, destroy or detoxify the waste material?
4. By what routes or means (if any) can the wastes migrate off the reservation?
5. What effects could occur (or might have occurred) through the discharge or release of the wastes?

The purpose of this report is to summarize and evaluate the information collected during Phase I of the IRP.

Phase I Project Description

The goal of the first phase of the program was to identify the potential for environmental contamination from past waste disposal practices at Griffiss AFB, and to assess the probability of contaminant migration beyond the installation boundary. The activities undertaken by Engineering-Science (ES) in Phase I included the following:

- Review site records
- Interview key personnel familiar with past generation and disposal
- Inventory wastes

- Determine quantities and locations of current and past hazardous waste storage, treatment and disposal
- Evaluate disposal practices and methods
- Determine adequacy of storage, treatment and disposal facilities
- Gather pertinent information from Federal, state and local agencies
- Evaluate compliance with Federal, state and local regulations
- Assess potential for contamination
- Preliminary evaluation of extent of potential contamination
- Determine potential for materials to migrate off site
- Conduct field inspection
- Determine the need for emergency response

In order to perform the on-site portion of the records search phase, ES assembled the following core team of professionals:

- B. L. Padden, Environmental Engineer and Project Manager, BSCE, 5 years of professional experience
- J. R. Absalon, Hydrogeologist, BS Geology, 8 years of professional experience
- D. S. Fry, Environmental Engineer, BSCE, 6 years of professional experience
- M. S. Guthrie, Environmental Engineer, MSCE, 1 year of professional experience
- R. J. Reimer, Chemical Engineer, MSChE, 2 years of professional experience

The on-site portion of the Records Search phase was performed at Griffiss AFB April 27 through May 1, 1981. During this period formal interviews were conducted with key base personnel. File searches were conducted within on-site organizations which generate, handle, transport, and dispose of waste materials. Records of eight Research and Development (R&D) facilities located at base annexes were reviewed. Site visits were not conducted at these or other annex locations because waste generation and disposal problems were not identified. Site visits and field reconnaissance were conducted at all identified facilities that treated, stored or disposed of hazardous materials. These facilities include landfills, waste treatment facilities (both on site and off

site), material storage areas, R&D laboratories, industrial shops and other support facilities. The information collected during this intensive record search is summarized and evaluated in subsequent chapters.

CHAPTER 2

INSTALLATION DESCRIPTION

CHAPTER 2

INSTALLATION DESCRIPTION

LOCATION, SIZE AND BOUNDARIES

Griffiss Air Force Base is located in central New York State, approximately two miles northeast of the City of Rome, Oneida County, New York (Figures 2.1 and 2.2). The base proper covers approximately 3900 acres and is situated in the broad, relatively flat valley of the Mohawk River (Figure 2.3). Present land uses for areas adjacent to the base are as follows:

Northeast - The area northeast of the base is primarily agricultural with old residential areas.

Southeast - This area is also primarily agricultural with low density residential. The city of Utica with a population of 95,000 is 16 miles away.

Southwest - The city of Rome is located southwest of the base and has a population of 50,000 people. The area is primarily residential with light industry and commercial development.

Northwest - This area is agricultural with residential areas and outdoor recreational facilities.

Besides the main base, there are 11 annexes that are part of the Griffiss Air Force Base facilities. Two of these annexes are dedicated to base support and the remaining 9 are utilized for research and development purposes by the Rome Air Development Center of the Air Force Systems Command. The locations of the annexes are shown in Figure 2.4 and a description of each annex is presented in Appendix A.

ORGANIZATION AND MISSION

The 416th Bombardment Wing is the host unit at Griffiss Air Force Base under the supervision of Strategic Air Command (SAC). The Wing's mission is the maintenance and implementation of effective air refueling operations, while providing long-range bombardment capability on a global scale. The 416th Bombardment Wing is composed of two operational squadrons, six maintenance and support squadrons, and the 416th Combat Support Group.

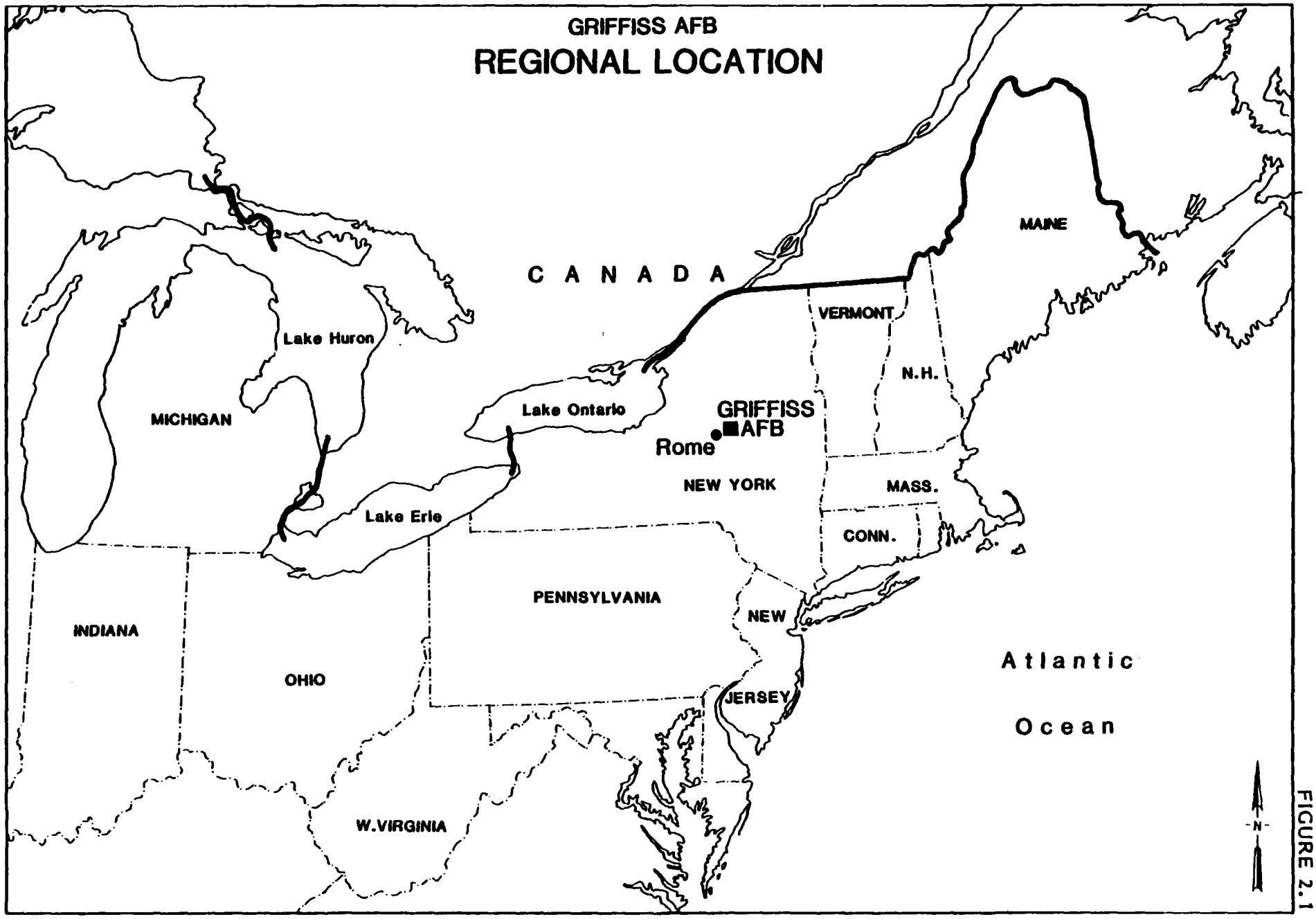

GRIFFISS AFB
REGIONAL LOCATION
CANADA
MAINE
VERMONT
N.H.
Lake Huron
MICHIGAN
Lake Ontario
GRIFFISS AFB
Rome
NEW YORK
MASS.
Lake Erie
CONN.
PENNSYLVANIA
NEW
INDIANA
OHIO
JERSEY
Atlantic
Ocean
W.VIRGINIA
N

FIGURE 2.1

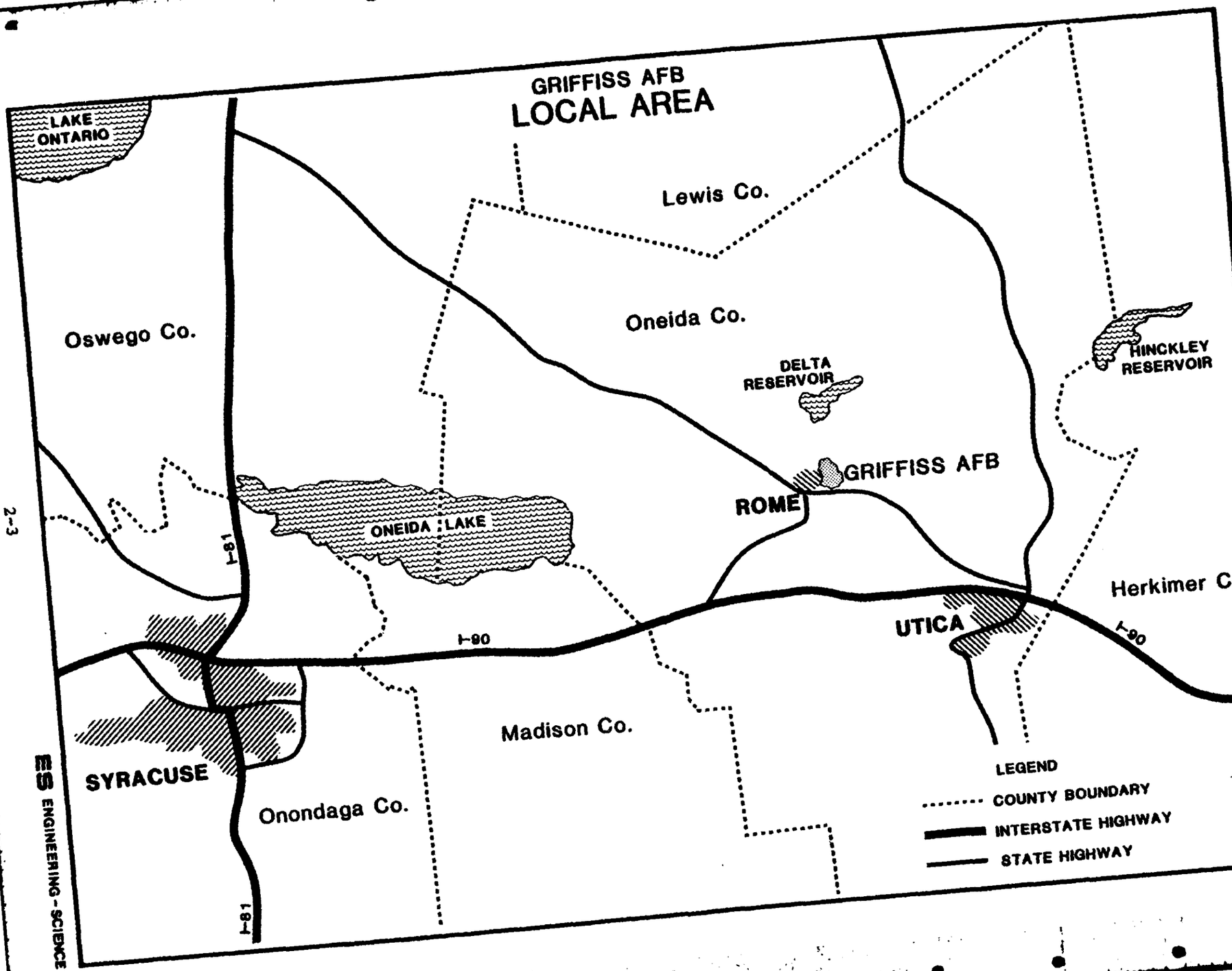
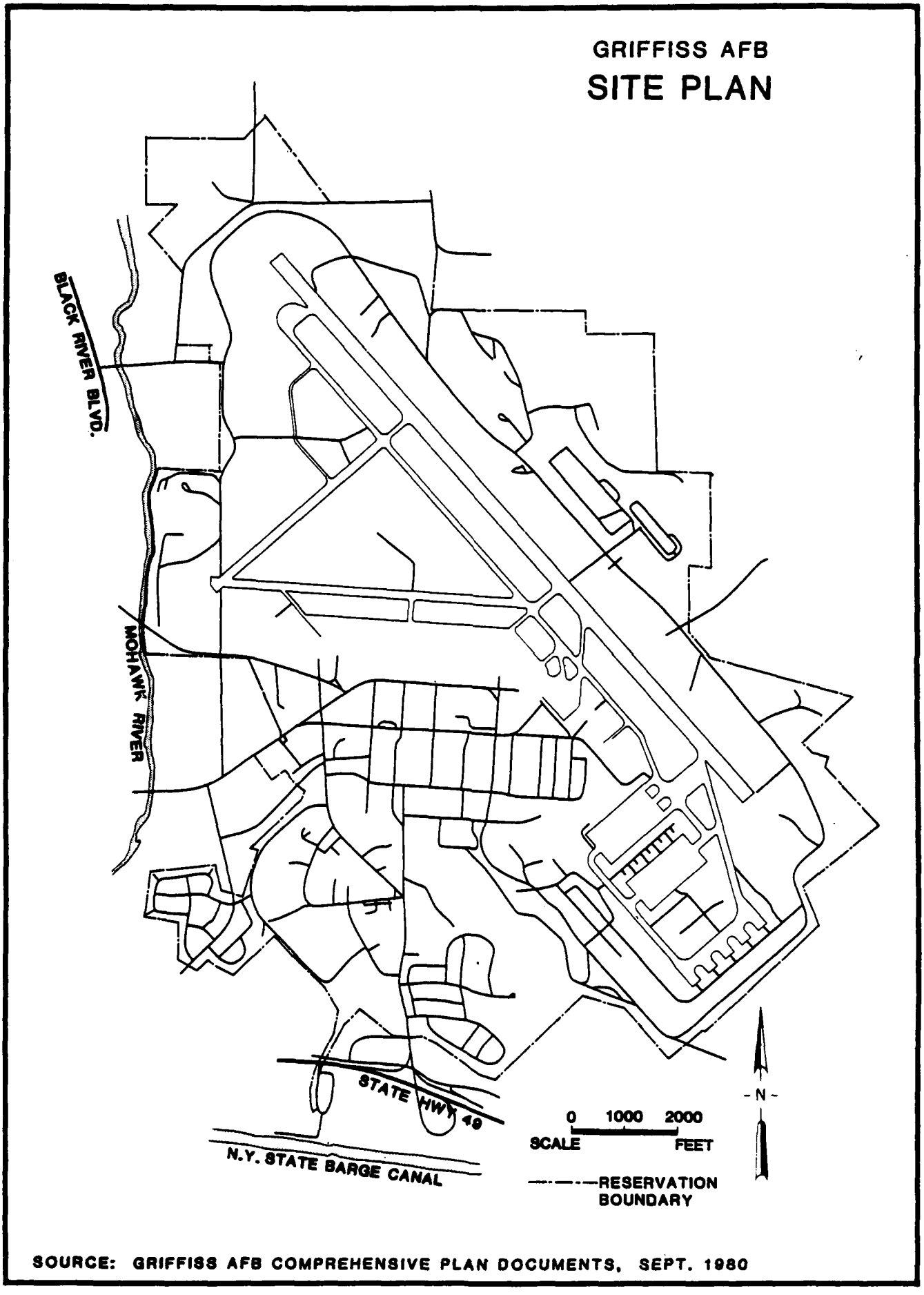


FIGURE 2.2

ES ENGINEERING-SCIENCE

FIGURE 2.3



SOURCE: GRIFFISS AFB COMPREHENSIVE PLAN DOCUMENTS, SEPT. 1980

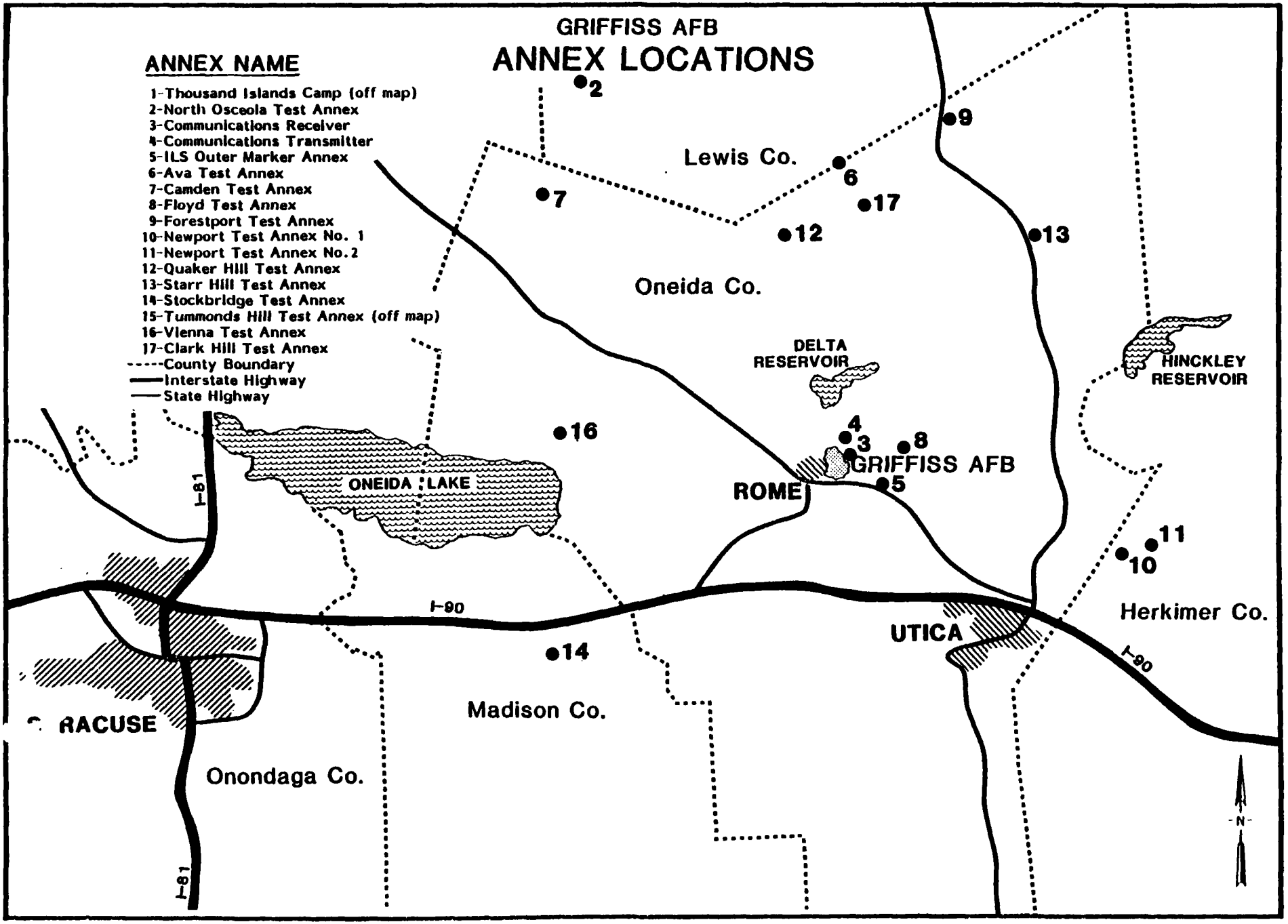

GRIFFISS AFB
ANNEX LOCATIONS
ANNEX NAME
1-Thousand Islands Camp (off map)
2-North Osceola Test Annex
3-Communications Receiver
4-Communications Transmitter
5-ILS Outer Marker Annex
6-Ava Test Annex
7-Camden Test Annex
8-Floyd Test Annex
9-Forestport Test Annex
10-Newport Test Annex No. 1
11-Newport Test Annex No. 2
12-Quaker Hill Test Annex
13-Starr Hill Test Annex
14-Stockbridge Test Annex
15-Tummonds Hill Test Annex (off map)
16-Vienna Test Annex
17-Clark Hill Test Annex
County Boundary
Interstate Highway
State Highway
Lewis Co.
Oneida Co.
Madison Co.
Onondaga Co.
Herkimer Co.
DELTA RESERVOIR
HINCKLEY RESERVOIR
ONEIDA LAKE
ROME
GRIFFISS AFB
UTICA
SYRACUSE
I-81
I-90
N

FIGURE 2.4

The operational or flying units supporting the host unit at Griffiss AFB are the 668th Bombardment Squadron equipped with the B-52 Strato-fortress, and the 41st Air Refueling Squadron equipped with the KC-135 Strato-tanker. Maintenance and support units directly supporting the Wing include the 416th Headquarters Squadron, 416th Airborne Missile Maintenance Squadron, 416th Avionics Maintenance Squadron, 416th Organizational Maintenance Squadron and the 56th Munitions Maintenance Squadron. The 416th Combat Support Group provides base support for the Bomb Wing.

Complete medical services at Griffiss AFB are supplied by the 50-bed USAF hospital with clinical services including general therapy, pediatrics, internal medicine, surgery, physical therapy, psychiatry, dermatology, ear-nose-throat, dental, and optometry available. Environmental Health conducts a preventive medicine program, and veterinary services provide base veterinary support for Griffiss AFB personnel and their mission.

Because of its host position, the 416th Bombardment Wing is responsible for support of Griffiss' various tenant units. This responsibility includes law enforcement, health care, administration, civil engineering, commissary, exchange and other services and facilities. The mission/functions of the major tenant organizations are summarized in the following paragraphs.

49th Fighter Interceptor Squadron (FIS) is responsible for the air defense of a 400,000-square mile area covering nine northeastern states and Nova Scotia. The 49th FIS supports the operational requirements of the North American Defense Command through its primary mission of interception, identification, and if necessary, the destruction of enemy aircraft.

Rome Air Development Center (RADC) functions as the focal point of the Air Force's expertise in command, control, and communication. RADC is responsible for developing improved communications and surveillance, including new methods of processing electronic intelligence and reconnaissance information. This includes testing electronic equipment not only for the Air Force but also for the Army, Navy, and other government

agencies such as NASA and FAA. Additionally, RADC is a national leader in research and development of improved cartographic systems and techniques including infrared mapping. The center provides technical or management assistance in support of studies, analyses, development planning activities, acquisitions, testing, modifications, and operations of aerospace systems and related equipment.

Continental Communications Division (CCD) is responsible for the engineering and installation of air traffic control, communications and meteorological equipment along with the operation and maintenance of these facilities. CCD has the responsibility for providing and maintaining communications in the northern United States, Canada, Greenland, and the Azore Islands. The 485th Electronics Installation Squadron and the 2019th Communications Squadron support the CCD mission on base.

485th Electronics Installation Group (EIG) has the responsibility for the upkeep of the nation's electronic defense systems and the production of radar approach control systems. It serves the northern United States, Canada, Iceland, Greenland, the Azores, and Europe, accomplishing in-house fabrication and assembly of electronics equipment, cables, components, cabinets, and shelters in support of specific programs and projects.

2019th Communications Squadron operates the base telecommunications center, administrative switchboard and the Military Affiliate Radio System (MARS). The squadron repairs NAVAIDS and radar facilities, teletype and cryptographic equipment. The control tower and the precision approach radar, controlling the flow of air traffic landings and takeoffs, are also operated by the Communications Squadron.

Detachment 8, 26th Weather Squadron provides 24-hour weather support to the 416th Bombardment Wing, 49th Fighter Interceptor Squadron, RADC and all other tenant units and all transient aircraft. It also provides weather support, via telephone, to Air Force Reserve and Air National Guard units at Schenectady Airport, Niagara Falls, Camp Drum and Seneca Army Air Field.

Other Tenants are assigned to Griffiss Air Force Base whose functions consist of Resident Auditor, Office of Special Investigations, Command Management Engineering Teams, etc. These organizations perform normal mission requirements associated with the management of a typical air base.

CHAPTER 3

ENVIRONMENTAL SETTING

CHAPTER 3

ENVIRONMENTAL SETTING

The environmental setting of Griffiss Air Force Base is described in this chapter with the primary emphasis directed toward identifying features that could transport hazardous waste contaminants off the base. Additional information is presented in Appendix C on the biological resources found on the base and in the region. Environmentally sensitive conditions are highlighted in the final section of the chapter.

METEOROLOGY

Precipitation and snowfall data furnished by Detachment 8, 26 Weather Squadron, Griffiss Air Force Base are summarized in Table 3.1. Mean annual precipitation is 45.6 inches, and mean annual snowfall is 107 inches. The evapotranspiration rate for the area is approximately 23 inches. The winter months generally occur between mid-December and mid-March with temperatures normally around 20°F. The spring, summer and fall are relatively mild with temperatures ranging from 31°F to 81°F. Wind speed averages 5 knots from the southwest.

GEOGRAPHY

Griffiss Air Force Base is located within the Mohawk Valley, a feature of the Ontario-Mohawk Lowland, which comprises the eastern-most extremity of the Central Lowland physiographic region. The Mohawk Valley forms a trough between the north margin of the Applachian Plateau to the south and the Adirondack Mountains to the north. The Mohawk Valley is conspicuous due to a general absence of relief.

Topography

Topography of the Griffiss Air Force Base area is due primarily to the deposition and subsequent erosion of glacial and alluvial sediments (from the now extinct Glacial Lake Iroquois) resting upon nearly flat-lying bedrock. The generally flat topography is typical of the region, with no dominant hills present and elevations averaging 500 feet above

TABLE 3.1

PRECIPITATION AND SNOWFALL DATA
GRIFFISS AFB

Month	Precipitation (In) Monthly Mean	Max	Min	Max 24 Hrs	Snowfall (In) Monthly Mean	Max	Max 24 Hrs
JAN	4.0	7.6	1.5	2.9	27	63	25
FEB	3.7	8.0	1.8	2.1	25	46	24
MAR	3.3	6.4	.8	2.3	17	41	13
APR	3.8	6.0	1.7	2.1	2	11	5
MAY	3.9	7.1	.8	2.7	*	6	3
JUN	3.8	9.9	.9	3.1	0	0	0
JUL	3.9	7.5	1.4	3.9	0	0	0
AUG	3.5	7.9	1.4	2.6	0	0	0
SEP	3.8	9.3	.8	2.5	0	0	0
OCT	3.4	8.7	.3	3.0	*	1	1
NOV	4.3	8.7	1.0	3.1	9	21	7
DEC	4.2	7.2	.9	3.0	27	54	15
ANNUAL	45.6	9.9	.3	3.9	107	63	25

Note: Indicated period of record is 35 years.

* Data not available.

sea level. The few topographic features worthy of note include an esker and a few isolated kames near Oriskany, southeast of the installation. The esker is a winding ridge of stratified sediments deposited by a stream that flowed on, within or beneath a glacier. The kames are rounded, domed hills of stratified glacial drift deposited by meltwater running off glacier margins or into melt depressions (Dale, 1953).

Griffiss Air Force Base lies within the Mohawk River Basin which has a drainage area of 3,456 square miles. The three notable streams draining the immediate area of the installation include the Mohawk River, Six Mile Creek and Three Mile Creek. The Mohawk flows southward along the west installation boundary, changing to an eastward course at a point southwest of the base. Both Three Mile and Six Mile Creeks follow generally southward courses, intersecting the Mohawk just to the south of Griffiss Air Force Base (Figure 3.1). Much of the Mohawk River has been channelized to form part of the New York State Barge Canal System, which extends from the Hudson River to Lake Erie. Water flow in these segments of the Mohawk is regulated by a system of locks (NYSDEC, 1976).

Streamflow is primarily the result of runoff in the Griffiss area. Many local streams are reported to run dry during summer months having typically reduced precipitation. According to Kantrowitz (1970) some 25 percent of total precipitation for the central New York State area is infiltrated into the ground-water system. A portion of this figure will eventually be discharged as base flow to feed area streams. The remaining 75 percent of precipitation, therefore, is lost as runoff or in evaporation-transpiration.

Flooding is not a significant problem for the Griffiss Air Force Base Area. Flooding of local streams is normally confined to stream channels. The flow of the Mohawk River north of Griffiss is regulated by the dam at the Lake Delta Reservoir. Below Griffiss the Mohawk becomes part of the Barge Canal System and the river flow is regulated by a system of locks.

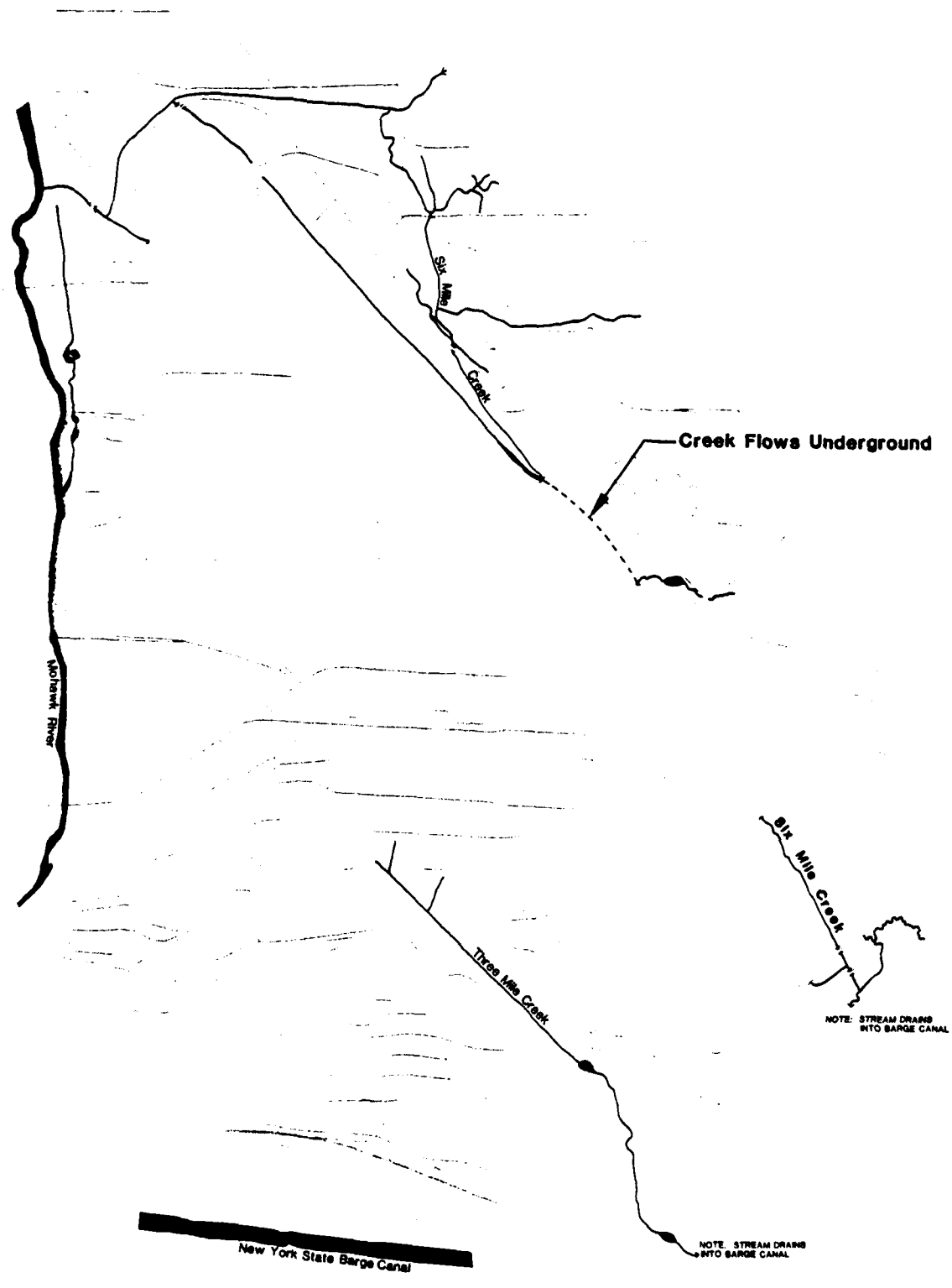
Surface Geology

The surface geology of the installation area is summarized by Halberg, et al (1962) as two distinct soil units, both of glacial origin (Figure 3.2). The Pleistocene age locustrine and recent alluvial deposits are essentially fine-grained stratified deposits of fine sands,

FIGURE 3.1

GRIFFISS AFB

SURFACE DRAINAGE

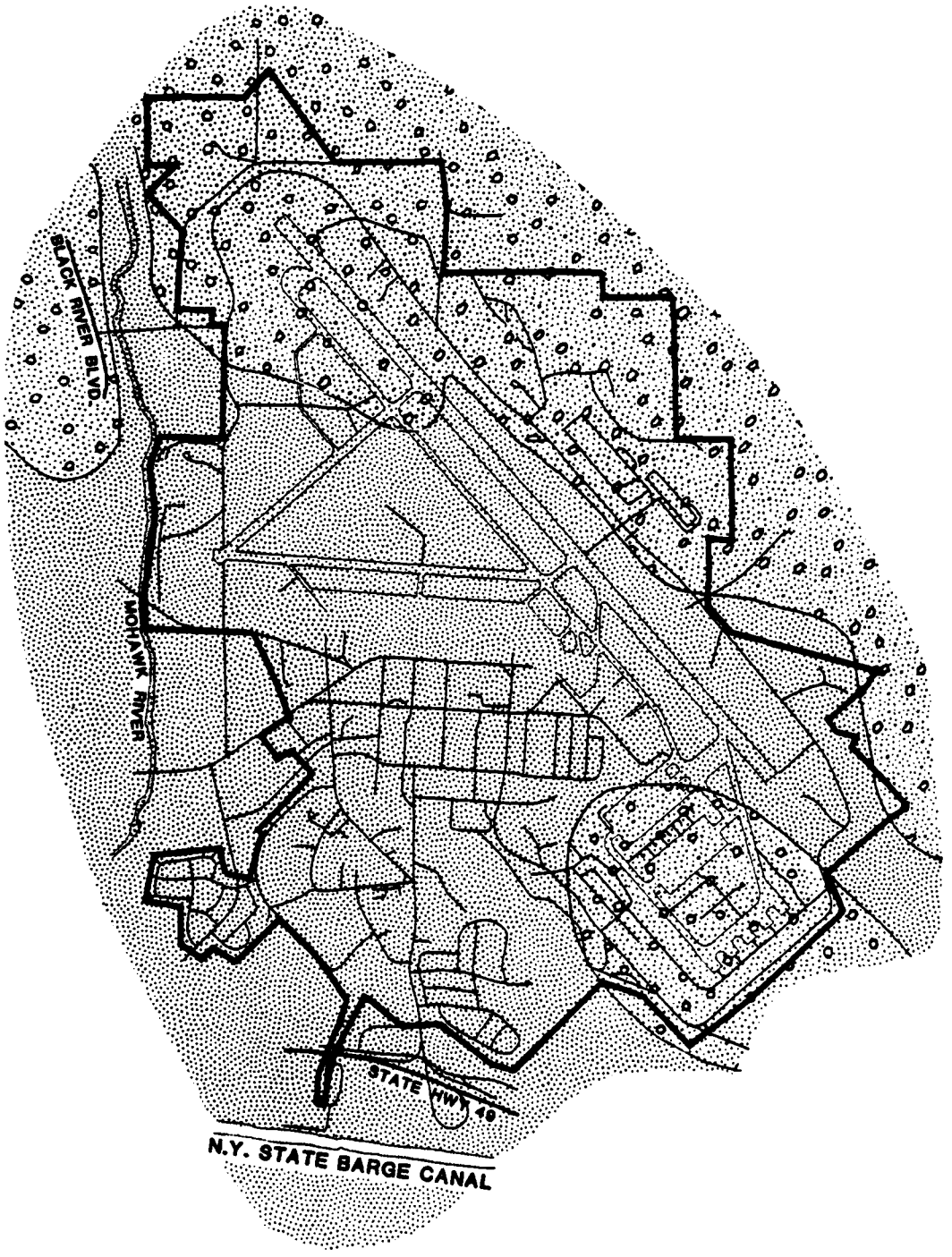


SOURCE: GRIFFISS AFB COMPREHENSIVE PLAN DOCUMENTS, SEPT., 1980

FIGURE 3.2

GRIFFISS AFB

SURFICIAL GEOLOGY



LEGEND

- QUATERNARY GLACIAL DEPOSITS
- QUATERNARY LACUSTRINE & ALLUVIAL DEPOSITS
- RESERVATION BOUNDARY

SOURCE: HALBERG, ET AL., 1962

sandy silts, silts, sandy clays and clays that are typically confined to lowland areas and existing or former stream channels. The fine fraction of this unit tends to be non-plastic or of low plasticity. Lacustrine, or lake bottom materials, are associated with the evolution of Glacial Lake Iroquois. Alluvial deposits are associated with modern stream channel development. The unit varies in thickness from 70 to 150 feet where present.

Pleistocene age glacio-fluvial and deltaic deposits consist of medium- to coarse-grained sands and gravels associated with glacial activity. The fluvial and deltaic materials are generally confined to upland areas, are stratified and vary in thickness from 10 to 140 feet.

Soils

Soils within the base boundaries have been studied during numerous subsurface investigations supporting geotechnical (structural foundation) investigations by the Herkimer-Oneida Counties Comprehensive Planning Program (1967) and by installation personnel (information undated). Approximately 80 percent of Griffiss Air Force Base is mapped as either "Cut and Fill Land" or as "Urban Land." These units are typically modified for installation utilization and vary in character and quality over short distances. With the exception of wet areas and stream channels, soils tend to be sandy and moderately well-drained. Table 3.2 summarizes the soil association information identified on the base (mapped on Figure 3.3).

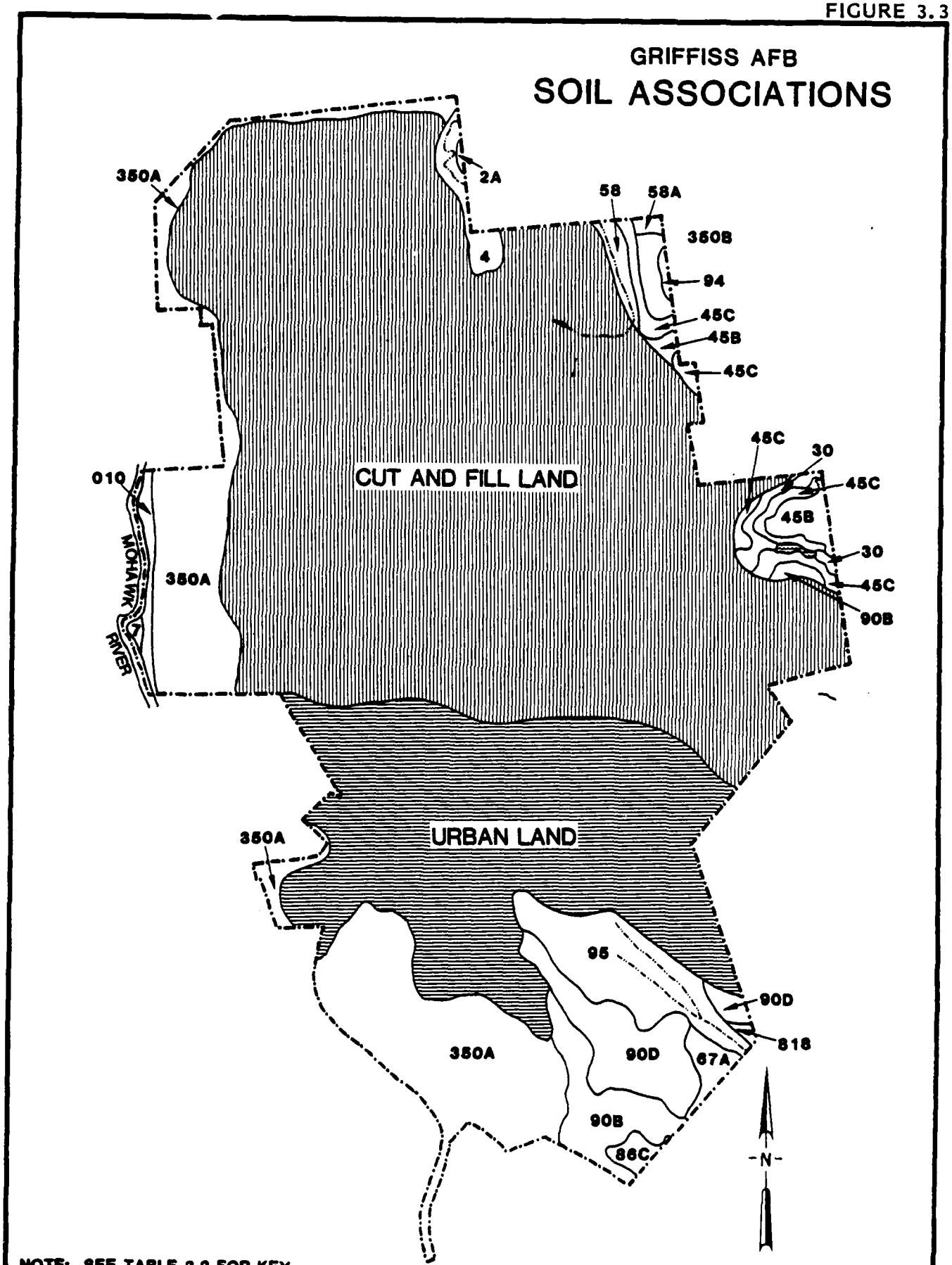
Subsurface Geology

The only significant consolidated geologic unit present at Griffiss Air Force Base is the Ordovician Age Utica Shale. This unit has been mapped by Dale (1953) and others and is depicted in cross section on Figure 3.4. The Utica is a relatively soft, black and gray carbonaceous shale containing calcareous argillites. Typically, the Utica varies in thickness from 300 to 400 feet. Dip measurements recorded at the Town of Holland Patent and at the type exposure at the City of Utica indicate a four to five degree southwest inclination (Dale, 1953).

Faulting of this unit is not directly observable as considerable overburden deposits conceal discontinuites. Dale (1953), however, postulates the existence of a fault trending north-south, about six miles east of Griffiss. Isachsen and McKendree (1977a) have mapped several

TABLE 3.2
SOIL ASSOCIATIONS
FOR FIGURE 3.3

Map Symbol	Soil Unit	Thickness	Slopes	Drainage	Usage	Remarks
	Cut and fill land Urban land	Character of these lands modified during installation developments.				
2A	Genessee Silt Loam	3.5-5	Level	Well	None	Prone to flooding
4	Eel Silt Loam	3.5-5	Level	Well	None	Prone to flooding
010	Middleburg Silt Loam	4	Level	Moderate	None	Prone to flooding
30	Homer Silt Loam	1.5-3.5	0-3%	Poor	None	Prone to seasonal wetness
45B	Hinkley gravelly loaming sand	2+	3-8%	Well	Light Construction	Gravel source
45C	Hinkley gravelly loaming sand	2+	8-15%	Well	Slope limits use	Gravel source
58	Wareham & Scarboro loams	1.5-2	0-3%	Poor	None	Prone to seasonal wetness
58A						
67A	Lakemont & Fonda soils	2.5	0-2%	Poor	None	Prone to seasonal wetness
81B	Deerfield loamy fine sand	2.5	2-6%	Moderate	Recreation	Prone to seasonal wetness
86C	Amboy fine sandy loam	2.5	6-12%	Well	Forest	Sand source
90B	Windsor loamy fine sand	2.5	2-12%	Well	Light Construction	Sand and gravel source
90D	Windsor soils	2.5	12-60%	Well	Slope limits use	Sand source
94	AuGres loamy fine sand	1+	0-4%	Poor	None	Prone to seasonal wetness
95	Muck and Peat	15-20	Level	Poor	None	Thick organic deposits
350A	Alton gravelly loam	4	0-3%	Well	Construction	Sand and gravel source
350B	Alton gravelly loam	4	3-8%	Well	Construction	Sand and gravel source



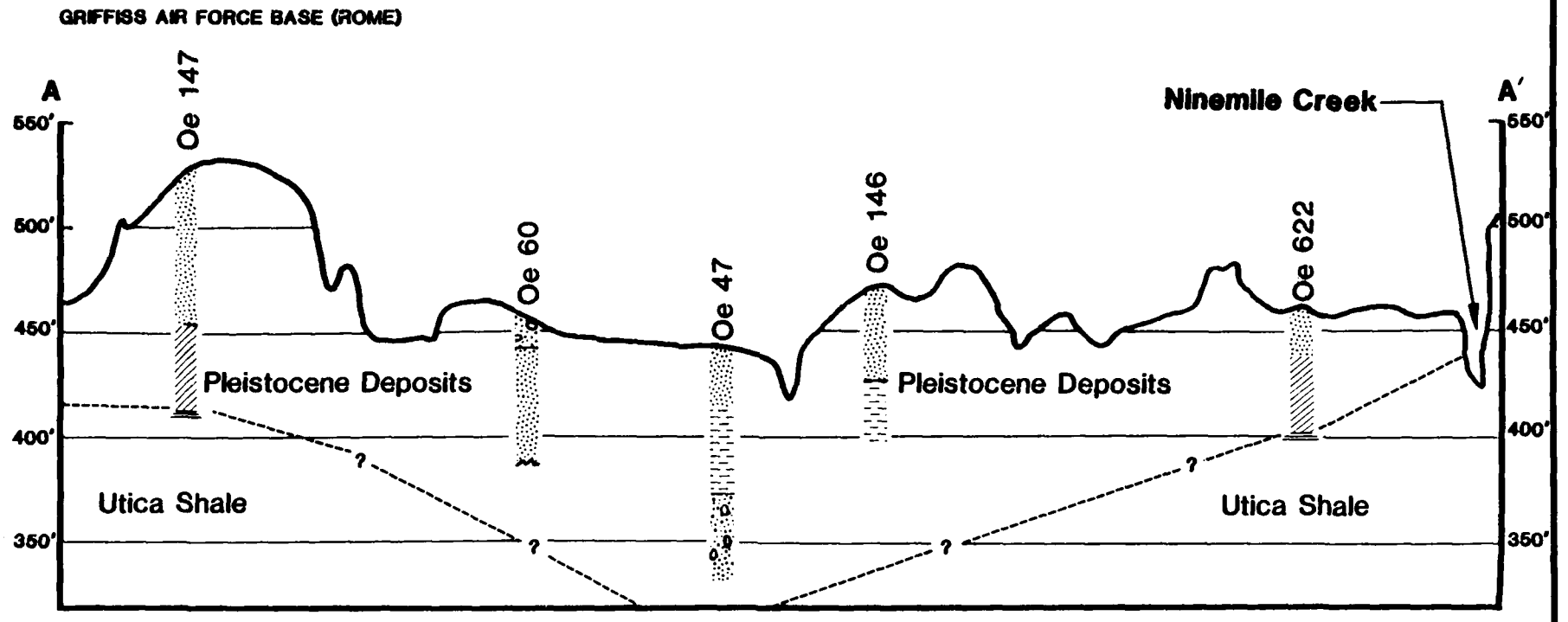
NOTE: SEE TABLE 3.2 FOR KEY

SOURCE: GRIFFISS AFB ENGINEERING OFFICE

GRIFFISS AFB

GEOLOGIC SECTION

FROM THREEMILE CREEK TO NINEMILE CREEK ALONG THE MOHAWK RIVER VALLEY



LEGEND

- RECORD MISSING
- SAND
- BEDROCK
- CLAY AND SIFT
- GRAVEL
- HARDPAN (till)

SOURCE: HALBERG, ETAL, 1962

FIGURE 3.4

faults in the Griffiss area, including one approximately four miles east of the base near the town of Stittville. In addition, they have mapped a structural lineament extending north-south from the Lake Delta Reservoir along the approximate course of the Mohawk River, terminating at a point at or near the western installation boundary. The structural lineament is a linear feature detected by topographic survey, satellite or U-2 photography and may represent a buried fault or simply a change in bedrock conditions. The relationship between earthquake activity and locally mapped lineaments and faults is unknown, however, numerous small, non-damaging earthquakes have occurred in central New York. These are due to the activity of Holocene "pop-ups", a localized zone possibly depressed by glacial weight. The recovery of such a zone may cause a small tremor in isolated areas.

Sedimentary strata of the Rome area are known to be jointed. Joint planes of this area are oriented north, west and southwest, with the predominant direction being east or southeast along the Mohawk Valley. Joint plane dips tend to be vertical or nearly vertical (Isachsen and McKendree, 1977b).

A thorough understanding of local structural geology is often necessary in order to investigate ground-water flow amounts, rates, directions and possible channelization of flow in fractured consolidated aquifers. In many cases of fractured rock aquifers, a fracture trace analysis usually precedes field work in order to determine the appropriate number, depth and location of monitoring wells.

HYDROLOGY

Ground Water

Ground-water resources in the project area have been briefly summarized by Halbert et al (1962) and Sinnott and Cushing (1978). Additional data have been obtained from Kantrowitz (1970), primarily reconnaissance studies based upon the compilation of available information. An attempt to incorporate installation well data into this discusison was not successful as well logs have not been retained on file.

It has been stated that one reason for a lack of ground-water resources data has been the region's traditional dependence on surface water supplies and no current regulations requiring the permitting of

industrial or domestic supply water wells (P. Lambert, Oneida County Public Health Department, 1981). It is presently estimated that approximately 95 percent of the region's water supplies are derived from surface sources. Ground water sources are primarily utilized by individuals in areas not served by regional or community systems such as the sparsely populated town of Floyd, or by farmers for irrigation purposes.

Most of the Griffiss Air Force Base area appears to lie within a ground-water recharge area. Recharge occurs where unconsolidated deposits are exposed at ground surface, or during dry periods, along stream beds traversing these deposits. Regional recharge has been estimated by Kantrowitz (1970) to be equivalent to 25 percent of total precipitation.

Hydrogeologic Units: Hydrogeologic units of the Griffiss Air Force Base area correspond directly to the geologic units previously reported (Halberg, et al 1962) and shown in Figure 3.2. A brief summary of each unit follows:

- Quatenary lacustrine and alluvial deposits comprise an unconsolidated, unconfined aquifer made up of primarily fine-grained sediments. It varies in thickness from 70 to 150 feet. Wells screened into this unit average 68 feet in depth. The well yield ranges from 2 to 40 gallons per minute, averaging 11 gpm. Water derived from this unit is of variable quality, and is usually hard.

- Quaternary glacial deposits make up an unconsolidated unconfined aquifer comprised of primarily coarse-grained sediments. It varies in thickness from 10 to 140 feet. Wells screened into this unit average 67 feet in depth. This is the most productive aquifer of the region, with typical yields varying from 10 to 290 gallons per minute, averaging 80 gpm. The water is reported to be of good quality.

- Utica shale comprises a consolidated, usually unconfined aquifer containing water in weathered upper zones, in joints, bedding planes and in secondary fissures. This unit may function under confined (artisian) conditions locally. The unit ranges in thickness from 300 to 400 feet and typical yields from 0.5 to 48 gallons per minute, averaging 7.5 gpm. Water supplies are normally drawn from upper reaches of this unit as unit reliability declines with depth, and lower elevations may be naturally contaminated by salts, hydrogen sulfide or methane.

The unconsolidated hydrogeologic units receive recharge from precipitation and from streamflow in dry periods. The unconsolidated aquifers serve as both recharge and storage units for the underlying rock aquifer.

Ground-water levels in the Rome-Utica area are reported to fluctuate seasonally from 3 to 15 feet per year. Kantrowitz (1970) reports that the ground-water levels in similar hydrogeologic units may vary from 5 to 25 feet in the adjacent Eastern Oswego Basin.

The water table of this region is reported to be a subdued replica of the topographic surface (Kantrowitz, 1970). Ground-water flow directions under unconfined conditions are typically down-gradient from a high potentiometric level to a lower potentiometric level. Ground-water discharge zones are typically springs, streams or surface water bodies.

The actual ground-water flow directions for the Griffiss Air Force Base area are undefined. Similarly, ground-water flow velocities and other physical characteristics of local aquifers have not been reported.

Surface Water

The New York State Department of Environmental Conservation has primary regulatory responsibility for the maintenance of water quality in the Griffiss Air Force Base area. Section 17-0301 of the State Environmental Conservation Law (Classificaton of Waters and Adoption of Standards) sets forth the legislative authority for both the assignment of stream classifications for all the waters of the state and the adoption of standards applicable to those classifications. The existing standards applicable to all classes of waters are set forth in Parts 700-703, Title 6, Official Compilation of Codes, Rules and Regulations. Waters of the Mohawk-West Canada Creek Planning Area are classified according to the following schedule, based upon utilization:

Classification	Utilization
AA	Water Supply - no discharges permitted
A	Water Supply
B	Bathing
C (T)	Fishing - trout stream
C	Fishing
D	Secondary contact recreation

The above classifications are subject to review every three years, or on an interim basis when circumstances warrant such a review.

Waters adjacent to and flowing within the limits of Griffiss Air Force Base are classified as follows:

Stream and Reach	Classification
Mohawk River, from Lake Delta to Rome/Floyd boundary	C
Mohawk River, east of Floyd boundary	B
Six Mile Creek, 0.0 miles to Tributary 2	C
Six Mile Creek, Tributary 2 to Tributary 4	C (T)
Six Mile Creek, Tributary 4 to Tributary 6 (within Griffiss AFB)	D
Six Mile Creek, from installation to Mohawk River	C (T)
Three Mile Creek, entire length	D

Note: The State of New York DEC identifies Six Mile Creek as Tributary No. 231 of the Mohawk and Three Mile Creek as Tributary No. 234 of the Mohawk River.

Water Quality Monitoring: Water quality monitoring of surface water at Griffiss Air Force Base is conducted by Air Force personnel in order to comply with State Pollutant Discharge Elimination System (SPDES) regulations, to determine the environmental impact of installation activities as mandated by applicable Air Force Regulations, and to comply with EPA directives relative to the discharge of leachate from Landfill No. 1.

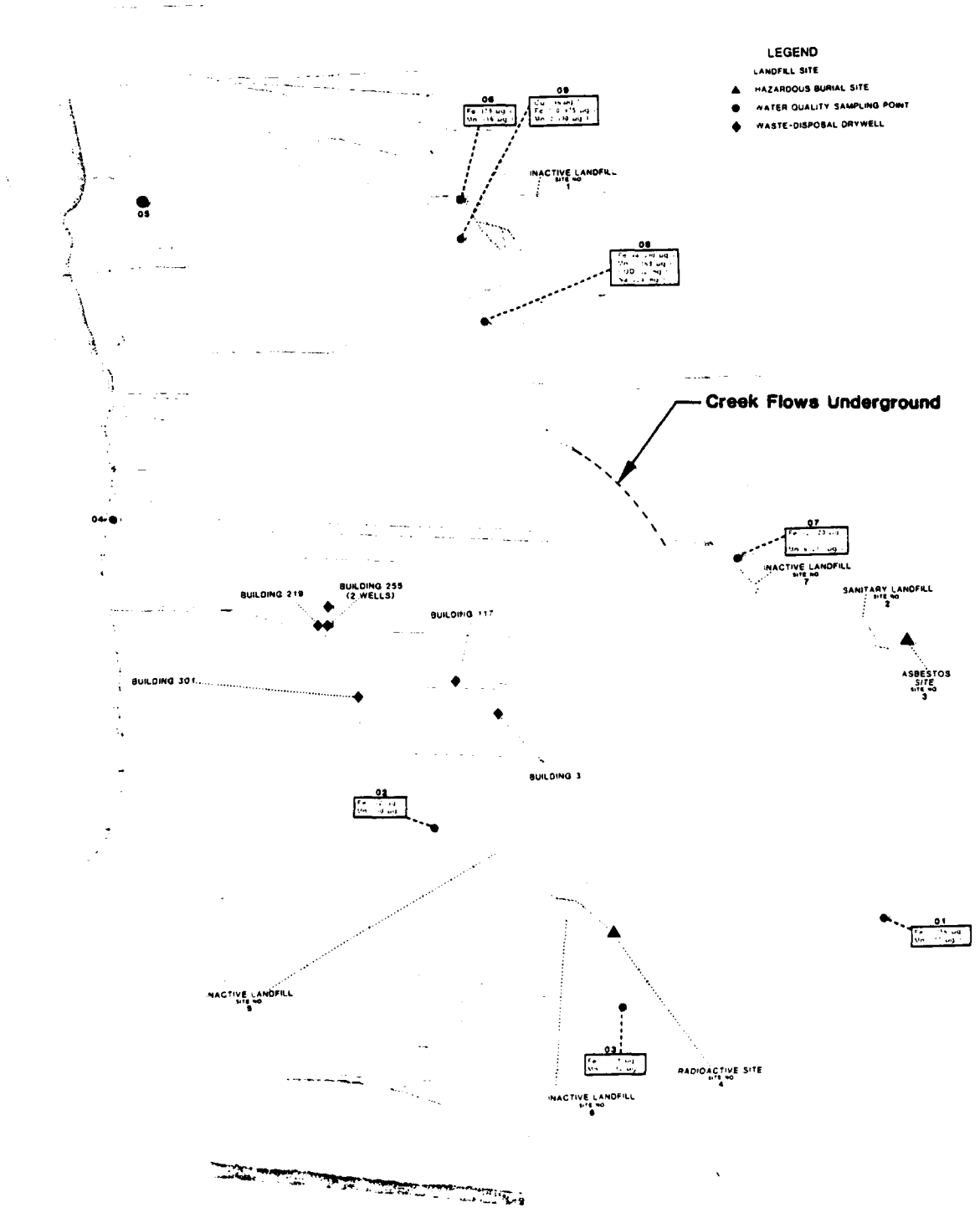
Griffiss Air Force Base currently maintains two SPDES permits. Permit No. NYD070860507 is applicable to the main installation. Sampling points are identified as follows on the permit renewal documents:

Sampling Point	Station Identification
001	Six Mile Creek Exit (from base)
002	Three Mile Creek Exit (from base)
003	Diversion channel
004	Mohawk Outfall
005	Barge

Prior to renewal of the installation SPDES permit, surface waters at Griffiss Air Force Base were sampled at locations shown on Figure 3.5. A review of water quality data indicates probable degradation at

GRIFFISS AFB

LOCATION OF WASTE DISPOSAL FACILITIES & WATER SAMPLING POINTS



NOTE: VALUES GIVEN ARE MAXIMUM CONCENTRATIONS

SOURCE: GRIFFISS AFB COMPREHENSIVE PLAN DOCUMENTS, SEPT., 1980

the following historical sampling points (1980 data):

Sampling Point	Identification	Parameters
01	Six Mile Creek Exit	iron, manganese
03	Three Mile Creek Exit	iron, manganese
06	Six Mile Creek Exit	iron, manganese
07	Stream entering base	iron, manganese
08	Six Mile Creek (leachate)	iron, manganese sodium, COD
09	Six Mile Creek (leachate)	iron, manganese, copper

These data suggest the degradation of Six Mile Creek by leachate emanating from Landfill No. 1 at sampling points 08 and 09. However, it must be noted that water entering the installation at sampling points 06 and 07 contains elevated levels of iron and manganese and may impact water quality observed at sample point 01. Baseline data relative to regional surface water quality for local streams is required to investigate this point further, but is not available. Data reported from sample point 03 (Three Mile Creek Exit) does indicate an increase in iron and manganese levels over point 02, the headwaters of the same stream. The cause for the increase in contaminant levels may be related to base activities. Water quality observed at sampling points 04 and 05 is generally good.

SPDES Permit Number NY 0037371 is applicable to the Verona Test Annex water treatment plant outfall. Water quality monitoring data for this monitoring point were reviewed at the time of the installation site visit (27 April - 1 May 1981). Data indicates that water quality generally falls within permitted limits for the chemical parameters tested. It has been reported by base personnel that the only SPDES permit violation at this test annex has been due to ground water infiltration causing excessive discharge volumes.

Limited surface water quality information has been developed as a result of the leachate flowing to Six Mile Creek from Landfill No. 1. A EPA Region II letter report (10 July 1980) describing conditions at the landfill and proximate environs noted that the leachate was degrading the quality of Six Mile Creek with the following contaminants:

Chemical Oxygen Demand

Specific conductance

Total dissolved solids

Color

Iron

Manganese

Sodium

EPA also considered moderate contamination levels of copper, lead and the herbicide Silvex to be a problem. An Air Force analysis dated June, 1980 also detected low levels of phenols present in the landfill leachate. This EPA report recommended additional monitoring for toxic organic substances and the construction of a leachate treatment facility to permit the collection and neutralization of contaminants.

Surface water quality monitoring is also performed by the State of New York Department of Environmental Conservation at selected locations in order to check STP efficiency and to comply with provisions of the Federal Clean Water Act (FCWA). The sampling point in closest proximity to Griffiss Air Force Base is located at the Mohawk River at Canal Gate 6, southwest of the installation. Data furnished (dated 25 June 1980) indicate a moderately high bacteria level. Other parameters tested indicate generally acceptable water quality.

Non-Installation Discharge To Regional Surface Water: The New York Department of Environmental Conservation has identified the following non-installation discharge sources to surface waters adjacent to Griffiss Air Force Base:

Discharger	Type	Capacity (MGD)	Effluent	Receiving Waters
Rome STP*	STP*	9.0	Secondary Treat.	Mohawk River-Barge Canal
Revere Copper & Brass Rolling Mill	IND+	8.26	Process & Cooling	Barge Canal
Revere Ware	IND	0.8	Cooling	Barge Canal
Rome Cable	IND	1.79	Process & Cooling	Wood Creek to Oneida River

* Sewage Treatment Plant
\+ Industrial Waste

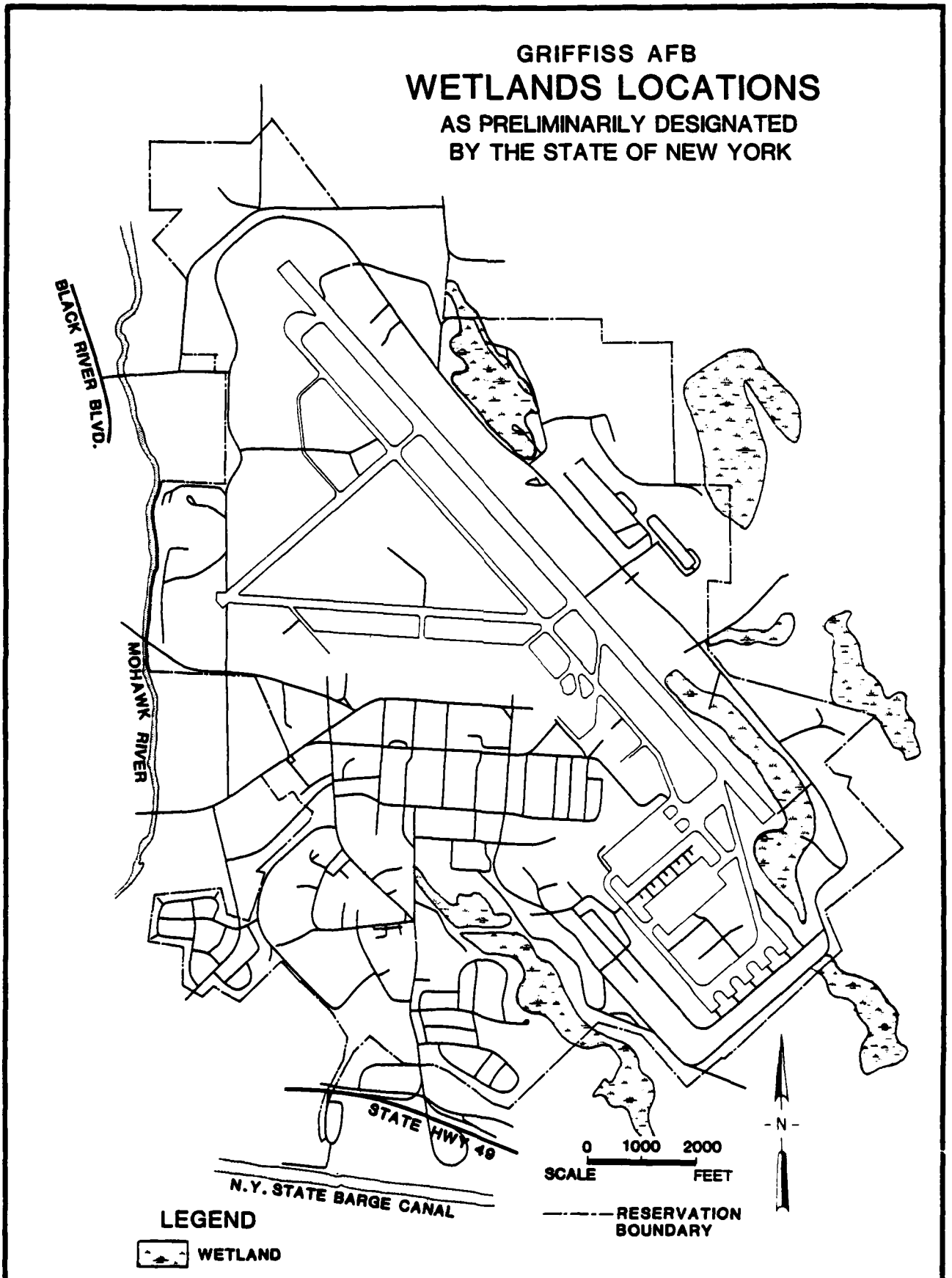
The above non-installation discharges may adversely impact the quality of the Mohawk River/Barge Canal system downstream of Griffiss Air Force Base.

ENVIRONMENTALLY SENSITIVE CONDITIONS

Several environmentally sensitive conditions were noted at Griffiss Air Force Base which need to be considered when handling and disposing of hazardous waste materials. These sensitive conditions are as follows:

1. The base is located within what must be regarded as a ground-water recharge zone. The topography of the area is generally flat, limiting runoff rates, and region soils are typically granular, favoring moderate infiltration rates. It is reasonable to expect pollutants mobilized by precipitation to ultimately percolate downward into local aquifiers.
2. Hydrogeologic units identified at the site are located at or near ground surface and receive recharge directly from precipitation or streamflow.
3. The annual average total precipitation at the site is high (rainfall 45.6 inches and snowfall 107 inches).
4. Several areas preliminarily designated as wetlands by New York State have been identified on the base (Figure 3.6).
5. Surface waters (Six Mile Creek) are presently affected by leachate generated by Landfill No. 1. The problem has existed since 1974 and may be expected to continue until adequate closure measures are implemented.
6. Active water wells in the local area could be contaminated by pollutants emanating from waste disposal areas. A potable water supply for the RADC site is obtained from a well (construction data unavailable) located at Building 875. This well is approximately 1500 feet northwest of the general limits of Landfill No. 1. A second water well (construction data unavailable) is currently in service at Building 798. This well is located approximately 1000 feet south of Landfill No. 2. The existance and use of water wells on property adjacent to the base are uncertain.

FIGURE 3.6



SOURCE: GRIFFISS AFB COMPREHENSIVE PLAN DOCUMENTS, SEPT. 1980

CHAPTER 4

FINDINGS

CHAPTER 4

FINDINGS

To assess hazardous waste management at Griffiss AFB, past activities of waste generation and disposal were reviewed. This chapter contains a summary of the wastes generated by activity, a description of disposal methods used at Griffiss AFB, and an identification and evaluation of disposal sites located on the base. Figure 4.1 presents the decision tree utilized in the review of waste practices. This tree provided a logical algorithm for the consistent evaluation of all base practices.

PAST ACTIVITY REVIEW

To determine past activities on the base that resulted in generation and disposal of hazardous waste materials a review was conducted of all current and past waste generation and disposal methods. This review consisted of interviews with base employees, a search of files and records, and site inspections.

Waste Generated by Activity

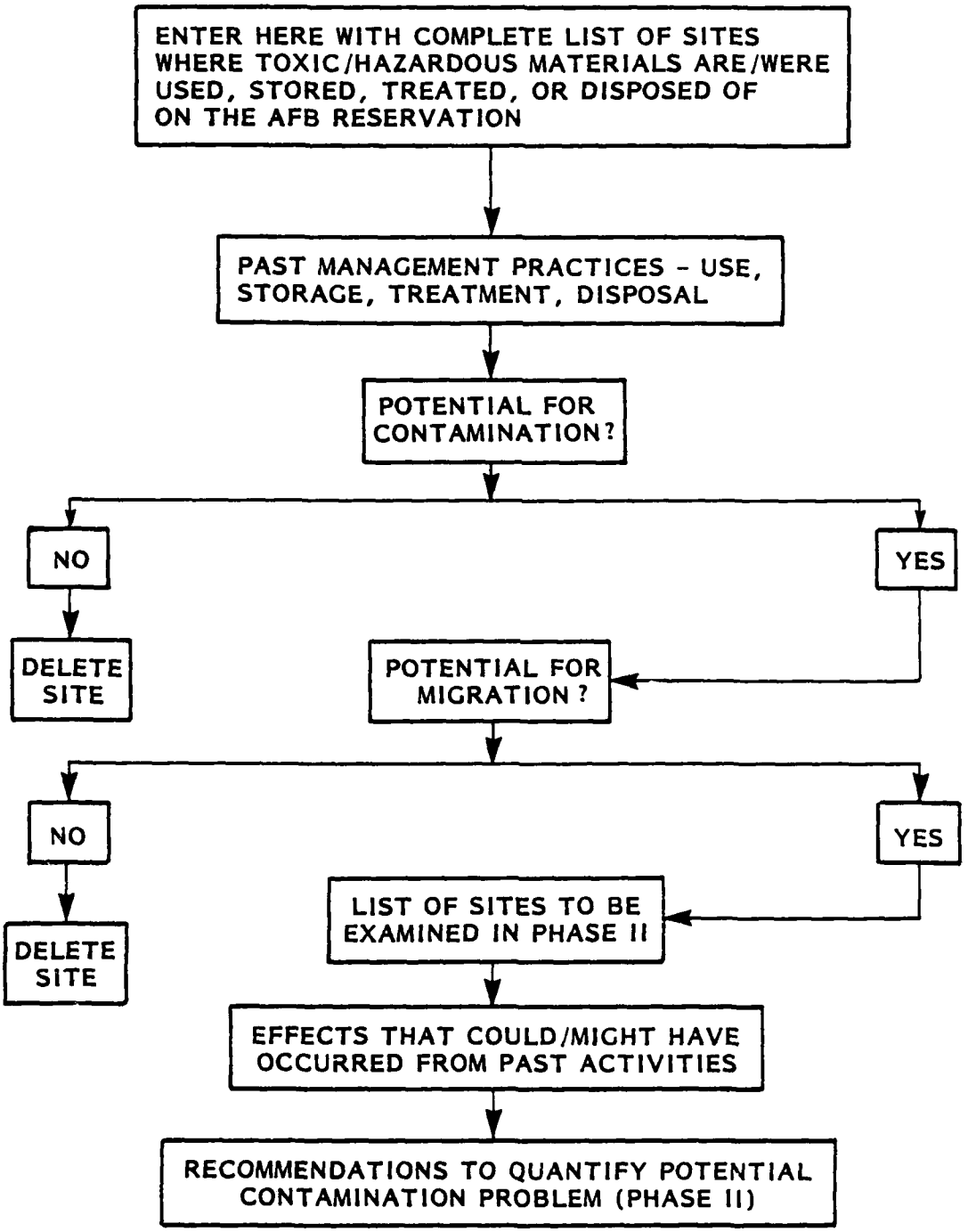
All hazardous wastes generated on Griffiss can be associated with one of the following seven activities carried out on base:

- Industrial Operations (Shops)
- Research and Development Labs
- Pesticide and Herbicide Utilization
- Radioactive Waste
- Fire Control Training
- Hazardous Waste Storage
- POL (Fuels Management)

The following discussion addresses only those wastes generated on base which are either hazardous wastes or potentially hazardous wastes. In this discussion a hazardous waste is defined as hazardous by either the Resource Conservation and Recovery Act (RCRA), or the GAFB documents

FIGURE 4.1

WASTE PRACTICE REVIEW DECISION TREE



which have been reviewed. A potentially hazardous waste is one which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste.

Industrial Operations (Shops)

Major mission support activity is conducted at Griffiss AFB by various groups and squadrons through the operation of industrial shops. These shops design, fabricate and repair components and parts for aircraft, missiles and aerospace ground equipment, as well as components, parts and items for special testing equipment, instrumentation and experimental equipment and devices. Most of the shops are located in Building 101, but some specialized fabrication and repair shops are located at different points around the base. A list of shops reviewed for this project and an indentification of hazardous materials present and potential problems is presented in Table 4.1. Table 4.2 identifies the hazardous wastes produced. A brief description of the industrial shops is given in Appendix A.

Research and Development Labs

The R&D Labs, along with other labs on base, provide primary and secondary mission support for GAFB. A brief description of each of the labs is appended. A list of the hazardous wastes each lab produces is given in Table 4.3.

Pesticide and Herbicide Utilization

Pesticides and herbicides have been used on GAFB to maintain the proper control of pest infestations and ground foiliage, respectively. At one time a 55 gallon spill of concentrated Lindane occurred. The pesticide and herbicide areas are discussed in the Appendix. Table 4.4 presents an overview of pesticide-and-herbicide-related wastes on GAFB and their sources.

Radioactive Wastes Sources: Buildings 510, 774, 123, 101, Depot 2, and Others

Several radioactive sources exist on base, ranging from a hospital night-vision tester and various research devices to storage shelves holding old electron tubes. Several of these sources hold government permits; others do not require them. Most of them are low-activity sources. The only potentially significant concentration is a radioactive material burial site located along Three Mile Creek. It is here that a number of old tubes were placed in a concrete vault and buried, collectively becoming a significant source. EPA testing has shown that

TABLE 4.1

INDUSTRIAL OPERATIONS REVIEWED

SHOP	HANDLE HAZARDOUS MATERIAL	POTENTIAL PROBLEM
416th AMS		
Auto Pilot/Instrument Shop	X	
Bomb/Nav Shop	X	
Comm/Nav Shop		
Doppler Shop		
ECM Shop		
Fire Control Shop	X	
PMEL	X	
416th CES		
Equipment Maintenance	X	
Carpenter Shop	X	X
Power Production	X	X
Demineralizer, Bldg. 778	X	X
Refrigeration/Heating Shops	X	X
Protective coating (Paint Shop)	X	
Welding Shop	X	
Steam Plant	X	X
416th CSG		
Auto Hobby Shop	X	
Reproduction	X	
Firing Range	X	
Wood Hobby Shop		
49th FIS		
AGE (Consolidated, Pwr & Non-Pwr)	X	
Egress Shop	X	
Jet Engine Shop (Consolidated)	X	X
Integrated Systems Shop		
Paint Shop	X	
Welding Shop	X	
416th FMS		
Powered AGE	X	X
Corrosion Control Shop	X	
Electric Shop		

SHOP	HANDLE HAZARDOUS MATERIAL	POTENTIAL PROBLEM
416th FMS (Cont'd)		
Jet Engine Test Cell	X	X
Environmental System	X	X
Fuel Cell Repair	X	
Hydrostatic Shop	X	X
Machine Shop	X	
Non-Destructive Inspection (NDI)	X	X
Pattern/Woodworking Shop	X	
Battery Shop	X	X
Pneudraulics Shop	X	X
Plastic/Fiber Glass Shop	X	X
Plating Shop	X	X
Propulsion Bearing Shop	X	X
Structural Repair Shop		
Survival Equipment Shop	X	X
Welding Shop	X	
Wheel & Tire Bearing Shop	X	X
416th MMS		
SRAM Maintenance Shop	X	X
Conventinal Munitions Maintenance	X	
Equipment Repair	X	
ALCM Maintenance	X	
416th Trans		
Allied Trades Shop	X	
Battery Shop/Dynamometer		
Vehicle Maintenance	X	X
Packing and Crating		
Paint Shop	X	
Welding Shop	X	
Tanker Repair/Refueling Maintenance	X	X

TABLE 4.2

INDUSTRIAL OPERATIONS (SHOPS) GENERATING HAZARDOUS WASTE

Name	Location (Bldg. #1)	Waste Material	Quantity Utilized (1980)	Disposal Method* Past	Disposal Method* Current
Machine Fabrication	3	-laquer thinner	<1 gal/day	SAN/DRY	SAN/DRY
		-paint	<1 gal/day	SAN/DRY	SAN/DRY
Battery Shop	101	-KOH with metal ions from serviced batt.	<1 gal/day	SAN	SAN
		-Batteries	occasional	DPDO	DPDO
Engine Shop	101	-Oily Rags	varies	LAN	REF
		-Speedi-dry	varies	LAN	REF
		-Excess Oil, Fuel, fluids	10-20 gal/day	LAN	WOC
Environmental Systems	101	-Waste oils and fuel	varies	LAN/FIR	WOC/FIR
Hydrostatics	101	-Empty Cans of Bromochloro-methane	varies	EMP	EMP
Plastic Shop	101	-Plastic Dust	varies	LAN	REF
		-Waste Solvents	<2 gal/day)	LAN	DPDO
		-Hardened and waste resin	varies	LAN	REF
Plating Shop	101	-Plated-item washdown	<20 gal/day	STM	SAN
		-Plating bath solution	occasional	DPDO	DPDO
		-Plating bath settled solids	10 gal/yr	DPDO	DPDO
Pneudralic Shop	101	-Trichloroethylene	<1 gal/day	SAN	DPDO
		-Methyl Ethyl Ketone (MEK)	<1 gal/day	SAN	DPDO
		-Toluene	<1 gal/day	SAN	DPDO
		-Contaminated Rags	varies	LAN	REF
Propulsion Shop	101	-degreasers, solvents, cleaners	1-3 gal/day	LAN	DPDO
		-Speedi-dry	varies	LAN	REF
Wheel and Tire	101	-degreasers, alcohol	<1 gal/day	LAN	DPDO
		-oily rags	varies	LAN	REF

*Key to Disposal Method:

DPDO = Consigned to DPDO for disposal
DRY = Dry well
EMP = Taken home by employees
FIR = Used for Fire Control Training
LAN = Landfill
REF = Picked up by non-hazardous refuse contractor
RPC = Consigned to RPC for disposal
SAN = Sanitary sewer system
SEP = Oil/water
STM = Storm sewer system
WOC = Waste oil contractor

TABLE 4.2 (CONTINUED)

Shop Name	Location (Bldg. #)	Waste Material	Quantity Utilized (1980)	Disposal Method* Past	Disposal Method* Current
Steam Plant	117	-Soot from firebox	1 truckload/yr	LAN	REF
		-Boiler Blowdown and Ion exchange rinse	<50,000 gal/yr	DRY/SAN	DRY/SAN
		-Floor Hosedown	occasion	STM	STM
		-Asbestos Insulation	10 bags/yr	LAN	LAN
		-Oil from separator	varies	LAN	WOC
		-Water from separator	varies	STM	STM
Survival Equipment	212	-MEK and Toluene contaminated rags	varies	LAN	REF
Tanker Repair	214-6	-Waste fuel	varies	LAN	WOC
		-Vehicle washdown	varies	SEP	SEP
Electric Power Prod.	219	-Greases, alcohols, solvents	<1 gal/day	LAN	DPDO
		-Battery acid (neutralized)	<1 gal/day	DRY	DRY
		-Antifreeze	<1 gal/day	DRY	DRY
Vehicle Maintenance	255	-Oil, cleaners, solvents	<5 gal/day	DRY	DRY
		-Floor washdown	occasional	SAN	SAN
Heating Shop	301	-Asbestos pipe insulation	uncertain	LAN	REF
Carpenter Shop	334	-Asphalt Coatings, cements	<1 gal/day	LAN	REF
Demineralizer	778	-ion exchange Recharge effluent	1000 gal/mo.	SAN	SAN
Aerospace Ground Equipment Shop	786	-Oil, solvents, fuel	<5 gal/day	LAN	DPDO
		-Equipment washdown	varies	SEP/STM	SEP/STM
Engine Test Cell	796	-Speedi-dry	varies	LAN	REF
		-hosedown effluent	varies	STM	STM
SRAM (Short Range Attack Missile)	829	-contaminated rags	varies	LAN	REF

*Key to Disposal Method:

DPDO = Consigned to DPDO for disposal
DRY = Dry well
EMP = Taken home by employees
FIR = Used for Fire Control Training
LAN = Landfill
REF = Picked up by non-hazardous refuse contractor
RPC = Consigned to RPC for disposal
SAN = Sanitary sewer system
SEP = Oil/water separator
STM = Storm sewer system
WOC = Waste oil contractor

TABLE 4.3

RESEARCH AND DEVELOPMENT LABS

Lab Name	Location (Bldg. #)	Waste Material	Quantity Utilized (1980)	Disposal Method* Past	Current
Etching, Rm 98	3	-Acids with metal ions -solidified sludge residue	<1 gal/day <1 lb/day	DRY LAN	DRY REF
Lab, Rm 91	3	-Acid and bases with metal ions	1 gal/day	DRY	DRY
Lab, Rm 64	3	-Solvent, acids, bases -Methanol, acetone, -Trichloroethylene	1-5 gal/day <1 gal/day	DRY DRY	DRY DPDO
Photo	various	-Developers, Fixers	3 gal/day	SAN	SAN
NDI Lab	101	-Photo lab solutions -Solvents -Toxic Dye Penetrants and Soaps	<2 gal/day <1 gal/day <1 gal/day	SAN SAN SAN	SAN SAN DPDO
RADC	106	-Etching and photo lab solutions	2-4 gal/day	SAN	SAN
High Power Lab	112	-Polychlorinated Biphenyl (PCB)-contaminated oil	varies	SUR	SUR
Supply fuels	223	-Excess contaminated fuel	<1 gal/day	LAN	WOC
Hospital & Dental X-Ray	510	-Spent developer and fixer	<2 gal/day	SAN	SAN
Hospital Clinical Lab	510	-Hexachlorophene -Formaldehyde	<1 gal/day <1 gal/day	SAN SAN	SAN SAN

*Key to Disposal Method:
DPDO = Consigned to DPDO for disposal
DRY = Dry well
LAN = Landfill
REF = Picked up by non-hazardous refuse contractor
SAN = Sanitary sewer system
SUR = Surface Runoff
WOC = Waste oil contractor

TABLE 4.4

PESTICIDES AND HERBICIDES WASTE GENERATION

Shop Name	Location (Bldg. #)	Waste Material	Quantity Of Waste (1980)	Disposal Method* Past	Current
Pesticides					
Entomology Shop	301	-Rinsed Raw-Material Pesticide Containers	varies	LAN	REF
		-Rinse water from containers	varies	DRY	DRY
		-Shower and washer effluent	varies	SAN	SAN
		-Excess Pesticide	2 gal/yr	DRY	DRY
Entomology Storage Shed (now torn down)	near 321	Lindane spill in 1955	<55 gal.	seeped into ground	
(Most buildings have been sprayed with Chlordane pesticide around their ground perimeter. It may still remain in the soil.)					
Herbicides					
Grounds Maintenance	T-9	-Rinsed Raw-Material Herbicide containers	varies	LAN	REF
		-Rinsewater from containers	varies	SAN	SAN
		-Excess herbicide	very small amount	SUR	SAN
Ground Maintenance	Golf Course	-Excess herbicide	very small amount	STM	STM
Forrestport	Annex Site	-92 acre defoliant application area runoff	uncertain	SUR	SUR

*Key to Disposal Method:

DRY = Dry well
LAN = Landfill
REF = Picked up by non-hazardous refuse contractor
SAN = Sanitary sewer system
STM = Storm sewer system
SUR = Surface runoff

even this site, however, is not a problem. Overall, radioactive sources do not pose an environmental problem and are well regulated.

Fire Control Training

The Fire Control Department has been operating a fire training area just east of the north end of the runway. This area serves as a practice burning/extinguishing area, where petroleum product fires are set. The product most utilized is JP-4 jet fuel. When available, waste JP-4 is used. There are no records available regarding the effects of these practices on the site environment. As the area is an open, undeveloped field, some infiltration of the fuel into the ground is certain. Also, infiltration of the extinguishing chemicals into the ground is certain.

Hazardous Waste Storage

Lot 69. This lot has been the interim storage area for some hazardous wastes generated on base. DPDO has authority over these materials, but Civil Engineering has responsibility for maintenance of the area. There are no current arrangements to remove or dispose of the material. The major hazard in this area is that of a spill. In the past, some small quantities have spilled onto the ground. The drums are unprotected from rain and sun so that some rusting has ensued. Although the drums are raised above ground on pallets and the area is fairly well diked, the potential exists for spillage infiltrating into the ground. The lot is not fenced and surveillance and/or warning signs are not present.

Drummed Hazardous Waste Holding Area, Building 101. Drums of hazardous material (including waste oil) which are to be picked up, relocated or emptied (as with waste oil) by an off-site contractor are stored in this outside, caged area behind Building 101. Drums are grounded and supported a few inches above ground. An overhead covering minimizes direct contact with rainfall. No spill provisions (curbs or dikes) were apparent around the cage. The surrounding open area is level concrete for at least 200 feet in any direction. No spills have occurred from this area in the past.

Fuels Management

Several types of liquid fuel are currently in use at Griffiss AFB. The largest of these, by volume used, is jet aircraft fuel (JP-4) at about one million gallons per month. Others include No.2 heating oil

(FS-2), No.6 fuel oil (FS-6), diesel fuel (DF-1) automotive gasoline, leaded and unleaded (MOGAS), and aviation gasoline (AVGAS). Information on Fuels Management above and beyond that given below is provided in Appendix D.

Waste and Recoverable Petroleum Products. Used or contaminated petroleum products are either filtered for reuse or disposed of by private contractors. The only exception is the occasional use of contaminated JP-4 in fire training (only JP-4 is used in fire training - no oils or heavy petroleum products are used). Contaminated or suspect JP-4 recovered from spills, defueling, or other operations is collected in one of the 25,000 gallon tanks in Tank Farm No. 2 where it is held for testing. If the POL laboratory has determined that the JP-4 can re-enter the system, the tank is emptied into tank trucks which take the fuel to the bulk storage area near the barge canal. Cleanup of reusable JP-4 consists of filtering it through bowsers as it proceeds through the system. The waste filter material is dried, bagged and disposed of with non-hazardous trash.

Waste oil, lubricants and hydraulic fluids are collected near their generation points in small (1000 gallons or less) tanks. Waste oils are also collected in one of the 25,000 gallon tanks in Farm No. 2, presumably from trucks. A private contractor comes on base about every other month and pumps out the storage tanks if they are sufficiently full. Records indicate the following amounts of waste oil/fuel removed:

April 1980 -	2350 gal
June 1980 -	2545 gal
August 1980 -	2800 gal
September 1980 -	2020 gal
December 1980 -	2000 gal
February 1981 -	2530 gal
March 1981 -	1350 gal

Generally these materials are collected from oil separators and 55 gallon drums.

The present contractor for waste oils disposal is Williamtown Irrigation, Williamstown, New York. This contract was initated in July, 1979 and will expire in August, 1981. Previous contracts for waste oil disposal are as follows:

Oldover Corp. P. O. Box 2 Saugerties, NY 12477	July 78 - June 79
Berks Associates, Inc. P. O. Box 305 Douglasville, PA 19518	July 77 - June 78
Norco P. O. Box 338 Bayonne, NY 07002	July 76 - June 77
Berks Associates	August 75 - June 76

The waste oil contractor does not accept solvents (TCE, degreasers, paint thinners, etc.); however, there is inadequate control over what is placed into the waste oil drums.

Fuel and Oil Spills. Spills occurring on base are categorized as class I, class II, or class III spills, depending on the volume spilled and area covered. Class I spills are those which cover less than two feet in any planar direction; these are generally controlled by the agency responsible for the spill. Cleanup generally consists of applying sorbent material which is to be kept on hand by all potential spillers.

A class II spill is anything larger than a class I spill but not exceeding 10 feet in any planar direction, less than 50 square feet total coverage, and of a non-continuing nature. Immediate response by the local agency is to be followed by notification of the fire department who assists, if required, in any cleanup. Class III spills are any which exceed the definitions of a class II spill. These require full report to command authority off base and are therefore considered severe. Based upon records from the last year and discussions with fire department personnel, the average frequency of a class III spill is about once every month.

The sorbent material which is used to clean up the majority of spills is called "oil sorbent" type 100, roll type, and is manufactured by 3M Company. It can be rolled out to cover small spills or it can be applied as a dike to prevent the spreading of spilled liquids. For hydraulic fluids and perhaps fuel oil spills (based upon cleanup method documented for one such spill), a material "speedi dry" is used. For class II and III spills civil engineering has the responsibility for collecting the used sorbent material which is treated as a hazardous

waste. It is drummed and moved to the hazardous waste storage area (Lot 69). The fire department has experimented with the possibility of burning the waste sorbent in the past.

The spills logged during 1980 and the first three months of 1981 total approximately 100 (60 class I, 30 class II and 10 class III). The spills are not isolated to flightline/fueling operations, although most significant spills occur there.

DESCRIPTION OF DISPOSAL METHODS

On-Site Disposal Facilities

The on-site facilities which have been used for management and disposal of hazardous wastes can be categorized as follows:

-Landfills
-Gravity Separators
-Storm Sewer Systems
-Dry Wells
-Septic Tanks

These types of hazardous waste management facilities (HWMF) are discussed individually in the following sub-sections.

Landfills. On-site landfills have been used for disposal of solid hazardous and non-hazardous wastes at GAFB. Flyash from the base steam plant has been a major component of the fill material. Landfilling has been done at a total of seven separate locations on the base. A summary of pertinent information concerning each landfill is given in Table 4.5. The landfills are discussed individually below.

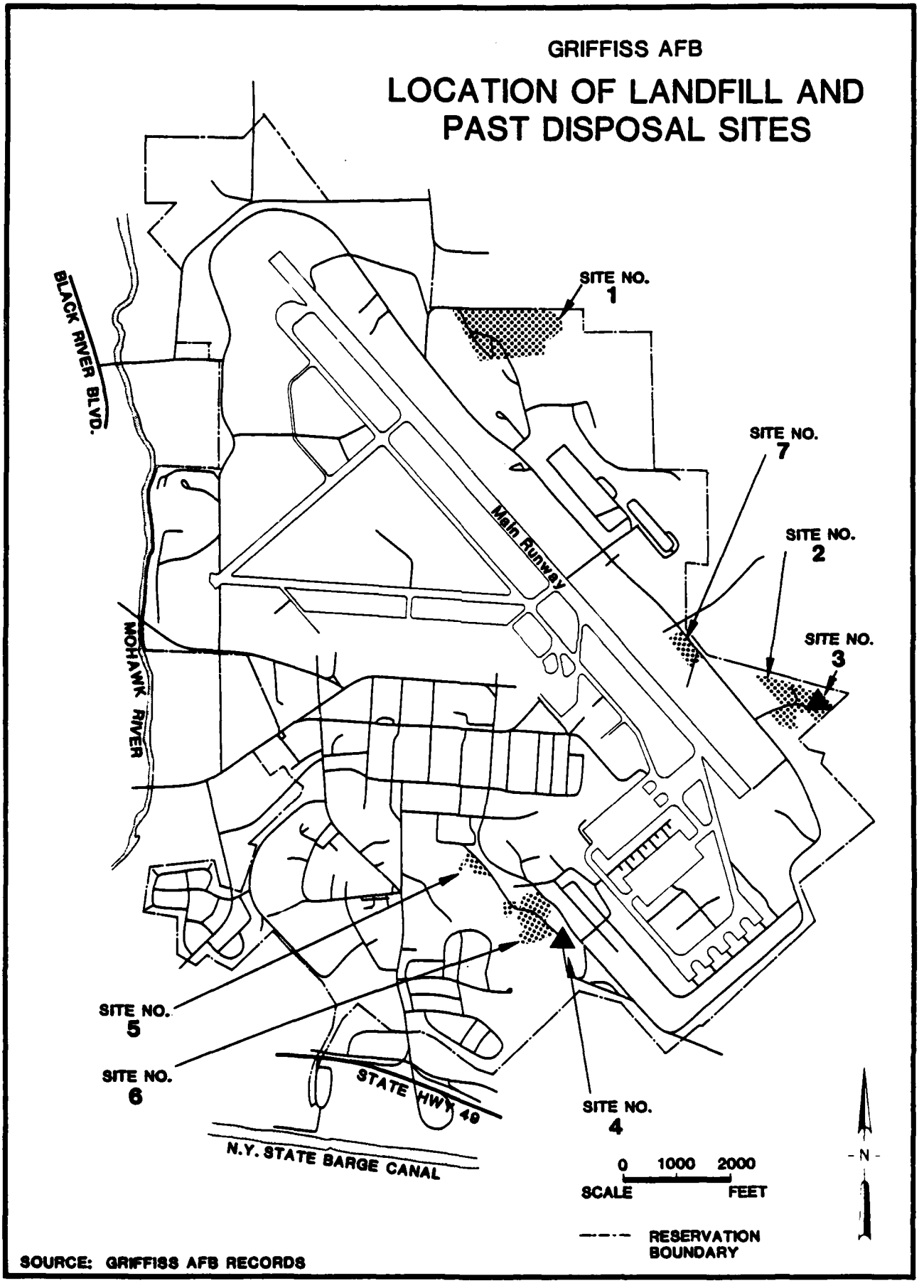
Landfill No. 1 is situated in the northeastern portion of Griffiss GAFB, encompassing approximately 22 acres (Figure 4.2). Figure 4.3 shows the approximate site boundaries of the landfill and the approximate configuration of the cells. Prior to its use as a landfill, a gravel quarry was located on the site. The landfill began operations in 1960 and closed in 1973. In 1973, debris from a fire in the base commissary was buried near the intersection of the entrance road and Six Mile Creek.

All landfilling was accomplished by trench and cover, with the exception of some hardfill and steam plant boiler ash which was dumped and

TABLE 4.5
GAFB LANDFILL INFORMATION SUMMARY

Landfill	Period Operation	Area Size (acre)	Types of Wastes Landfill	Estimated Quantity of Waste (cu. yd.)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
Number 1	1960-1973	22	general refuse hardfill, boiler ash.	90,000 - 180,000	Trench and cover	Landfill inactive and cover applied Partial plant cover.	Course - grained glacial soils	N.Y. State Barge Canal via Six-Mile Creek.	o highly permeable soils o surface leachate flows (3-7 gpm) o exposed wastes due to excavation and errosion
Number 2	1973-present (major activity ceased in 1980)	60	general refuse, hardfill	90,000 - 140,000	Trench and cover	Most of landfill inactive. Cover and grading incomplete. No plant cover.	Fine to medium grained lacustrine and alluvial soils.	N.Y. State Barge land via Slate and Six Mile Creeks.	o highly permeable o surface grading and cover incomplete o ponding of contaminated water o no plant cover for soil stabilization o wind blown debris
Number 3	1980	< 1	asbestos insulation	< 50	Pits with cover	Inactive with with cover applied. No plant cover.	Same as No. 2	Same as No. 2	o no plant cover for soil stabilization
Number 4	Mid 1950's (specific time period unknown)	< 1	waste vacuum tubes with low-level radioactivity	< 5	Disposal in vertical pipe (6-8ft)	Vertical pipe capped with concrete and covered. Re-vegetated.	Info. not available	N.Y. State Barge Canal via Three-Mile Creek.	o potential groundwater contamination due to low-level radioactivity
Number 5	1959-1960	4	general refuse	18,000	Open burning with fill of ash	Completely covered and re-vegetated.	Info. not available	N.Y. State Barge Canal via Three-Mile Creek.	
Number 6	1955-1959	8	hardfill and general refuse	38,000 - 62,000	Open burning with cover of ash. Some un-burned wastes landfilled.	Completely covered and re-vegetated.	Info. not available	To Three-Mile Creek wetland area.	o some ponding
Number 7	1950-1954	4.5	general refuse with some liquid wastes	60,000 - 130,000	Open burning with cover of ash	Completely covered and re-vegetated	Fine to medium grained lacustrine and alluvial soils	N.Y. State Barge Canal via Six-Mile Creek.	o highly permeable soils o potential groundwater contamination due to liquid wastes o some ponding

FIGURE 4.2


GRIFFISS AFB
LOCATION OF LANDFILL AND PAST DISPOSAL SITES
BLACK RIVER BLVD.
MOHAWK RIVER
Main Runway
SITE NO. 1
SITE NO. 7
SITE NO. 2
SITE NO. 3
SITE NO. 4
SITE NO. 5
SITE NO. 6
STATE HWY 49
N.Y. STATE BARGE CANAL
0 1000 2000
SCALE FEET
N
RESERVATION BOUNDARY
SOURCE: GRIFFISS AFB RECORDS

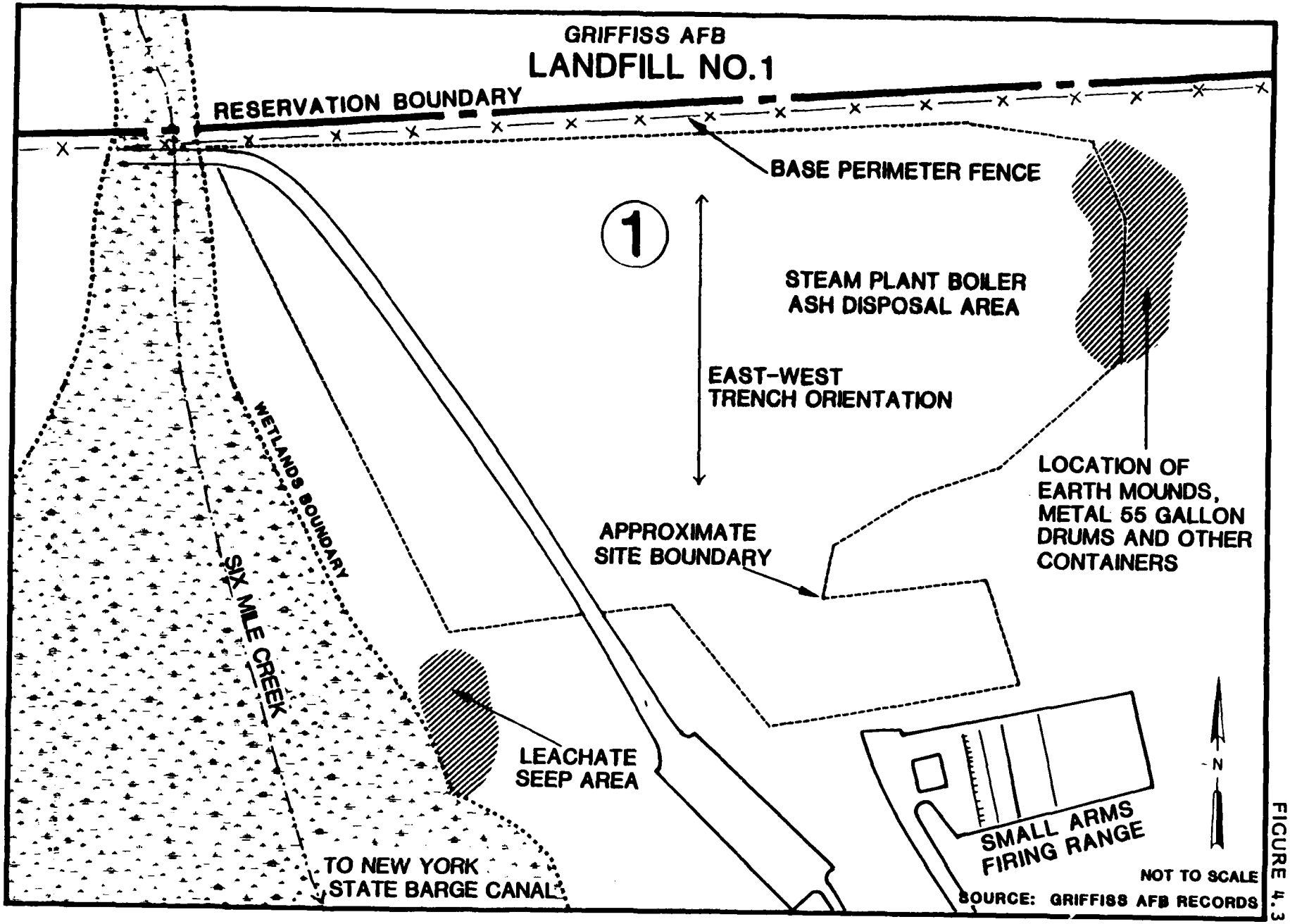

GRIFFISS AFB
LANDFILL NO.1
RESERVATION BOUNDARY
BASE PERIMETER FENCE
1
STEAM PLANT BOILER
ASH DISPOSAL AREA
EAST-WEST
TRENCH ORIENTATION
LOCATION OF
EARTH MOUNDS,
METAL 55 GALLON
DRUMS AND OTHER
CONTAINERS
APPROXIMATE
SITE BOUNDARY
WETLANDS BOUNDARY
SIX MILE CREEK
LEACHATE
SEEP AREA
TO NEW YORK
STATE BARGE CANAL
SMALL ARMS
FIRING RANGE
N
NOT TO SCALE
SOURCE: GRIFFISS AFB RECORDS

FIGURE 4.3

spread on the eastern edge of the trenches. Early cells were constructed in an east-west orientation 40 to 50 feet wide by 300 to 500 feet long. Depth of waste was 15 to 18 feet. During construction of the 2nd and 3rd trenches from the north, ground water was encountered and pumped to Six Mile Creek. A later trench was started in a north-south orientation through the east end of the earlier trenches, but was abandonned. Waste ash from the steam plant was used during one period as a cover material for the solid wastes.

Most of Landfill No. 1 appears to be graded to drain to a low area to the east, and then on to Six Mile Creek. The western portion of the site drains directly to Six Mile Creek about three miles upstream from its confluence with the New York State Barge Canal and Mohawk River. The site is at an elevation of about 540 ft. MSL. An inspection of the site indicates that it has been constructed in the relatively coarse-grained Pleistocene glacial deposits.

Leachate seeps are evident along the northeast bank of Six Mile Creek. These seeps appear to be coming from Landfill No. 1. An experimental treatment scheme consisting of two rock dikes (about two feet high) was constructed in an attempt to aerate and impound a small segment of Six Mile Creek, and potentially reduce some of the organic loading induced by the leachate flows. The leachate flow has become channelized near its interception by Six Mile Creek. At the time of observation the leachate contaminated flow to the creek was estimated to be 3 to 5 gpm. The EPA estimated this flow to be about 7 gpm.

Solid waste from Landfill No. 1 is visible in the drainage ditches of the road leading to the firing range. These wastes have been uncovered by road construction over the last solid waste cell and subsequent soil erosion due to runoff. There is also evidence of mounds of soil and waste on the eastern edge of the landfill. From many of these mounds unlabeled metal 55 gallon drums are exposed. The remains of decomposed cardboard drums are also visible. Other areas of the landfill are well vegetated in grass and much of the area has been reforested with red pine, white spruce, scotch pine, American cedar, larch, black walnut and evergreen vegetation.

Landfill No. 2 is situated in the eastern-most region of the base as shown in Figure 4.2. The boundaries of this 60-acre site are shown

on Figure 4.4. The lower or southern portion was operated as a location for hardfill disposal by an area method and other solid waste disposal by trench and cover method. The upper or northern portion of the landfill was operated in a trench and cover mode and was the last active disposal site on base. While major filling operations ceased in October 1980, one trench located in the southeastern-most extremity of the northern portion of the site has remained open to receive on board waste from overseas aircraft.

Part of the upper site is graded to drain to the northeast toward a tributary of Slate Creek which in turn drains to Six Mile Creek. The remainder of the upper site and the lower site drain to Six Mile Creek about one mile from its confluence with the New York State Barge Canal and Mohawk River.

At the time of the site visit, closure of the landfill was not complete. Some surface grading had been done; however, a number of stagnant ponded areas of discolored water were in evidence. During rainfall events this water would likely overflow to surrounding waterways, and during dry periods, these ponded waters would both percolate into the waste deposits or evaporate. No vegetative stabilization of the landfill has occurred.

A permanent wire mesh fence about 25 feet high by 150 feet long has been installed in the northeast area of the landfill as a wind blown refuse stop. While the fence may have been partially effective, some wind blown refuse paper and plastic could be seen on the edge of the surrounding woods. It is understood that during operation of this landfill, portable fences about six feet high surrounded the disposal areas. Security at the landfill consists of a gate across the entrance road and a three foot high perimeter security fence that borders the site on the southeast and north sides.

Landfill No. 3 is located within the limits of Landfill No. 2 as shown on Figure 4.5. Landfill No. 3 operated as a disposal area for asbestos wastes beginning operations in 1980 and received these wastes on an intermittent basis. Asbestos waste has been generated primarily from demolition and repair of asbestos insulated piping. The asbestos has been wetted, double bagged and hauled to the disposal area where pits were dug to about 8 feet deep in the approximate location shown on

FIGURE 4.4

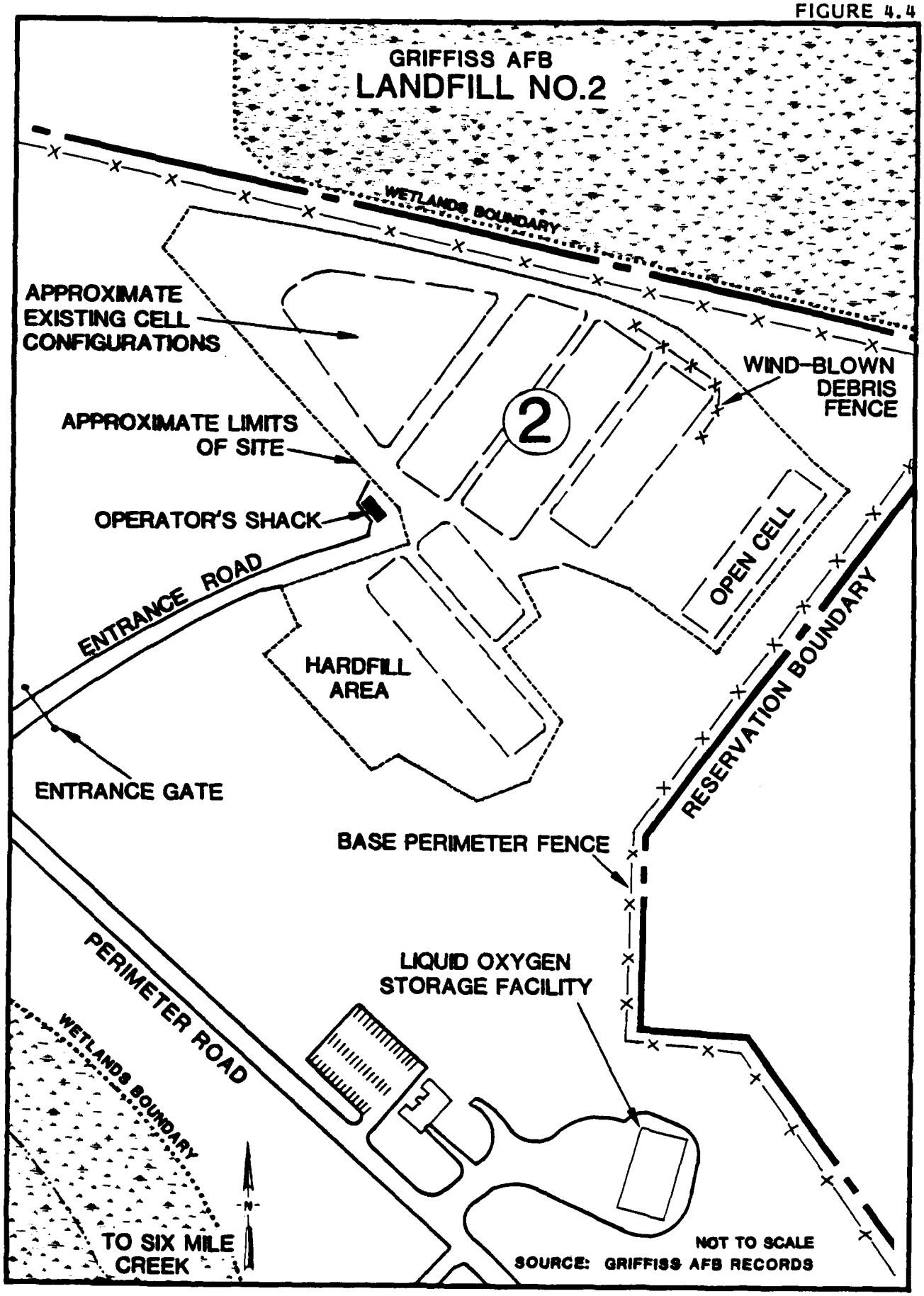

GRIFFISS AFB
LANDFILL NO.2
WETLANDS BOUNDARY
APPROXIMATE EXISTING CELL CONFIGURATIONS
WIND-BLOWN DEBRIS FENCE
APPROXIMATE LIMITS OF SITE
2
OPERATOR'S SHACK
ENTRANCE ROAD
OPEN CELL
HARDFILL AREA
RESERVATION BOUNDARY
ENTRANCE GATE
BASE PERIMETER FENCE
PERIMETER ROAD
LIQUID OXYGEN STORAGE FACILITY
WETLANDS BOUNDARY
N
TO SIX MILE CREEK
NOT TO SCALE
SOURCE: GRIFFISS AFB RECORDS

FIGURE 4.5

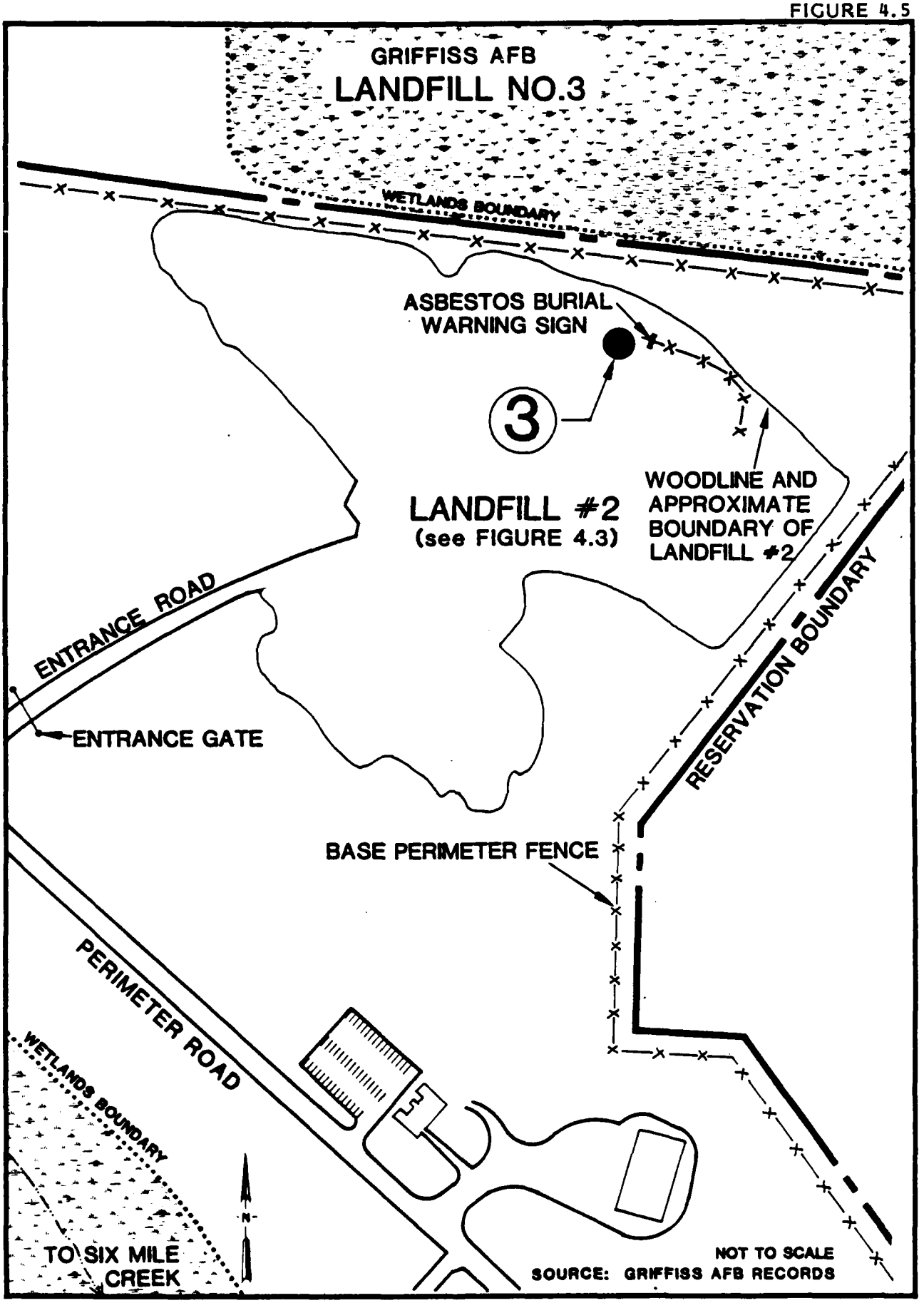

GRIFFISS AFB
LANDFILL NO.3
WETLANDS BOUNDARY
ASBESTOS BURIAL
WARNING SIGN
3
LANDFILL #2
(see FIGURE 4.3)
WOODLINE AND
APPROXIMATE
BOUNDARY OF
LANDFILL #2
ENTRANCE ROAD
ENTRANCE GATE
RESERVATION BOUNDARY
BASE PERIMETER FENCE
PERIMETER ROAD
WETLANDS BOUNDARY
TO SIX MILE
CREEK
N
NOT TO SCALE
SOURCE: GRIFFISS AFB RECORDS

Figure 4.5. Security for the site is the same as that for Landfill No. 2. A warning sign in the vicinity of the disposal area physically identifies the location. All asbestos wastes were said to be buried within 25 feet of the sign. It has been estimated that one ton of asbestos is located in Landfill No. 3. There are no visible surface features other than the sign to indicate the location or extent of the asbestos burial area. This method of asbestos disposal has been approved by the State of New York, the EPA and Air Force regulations.

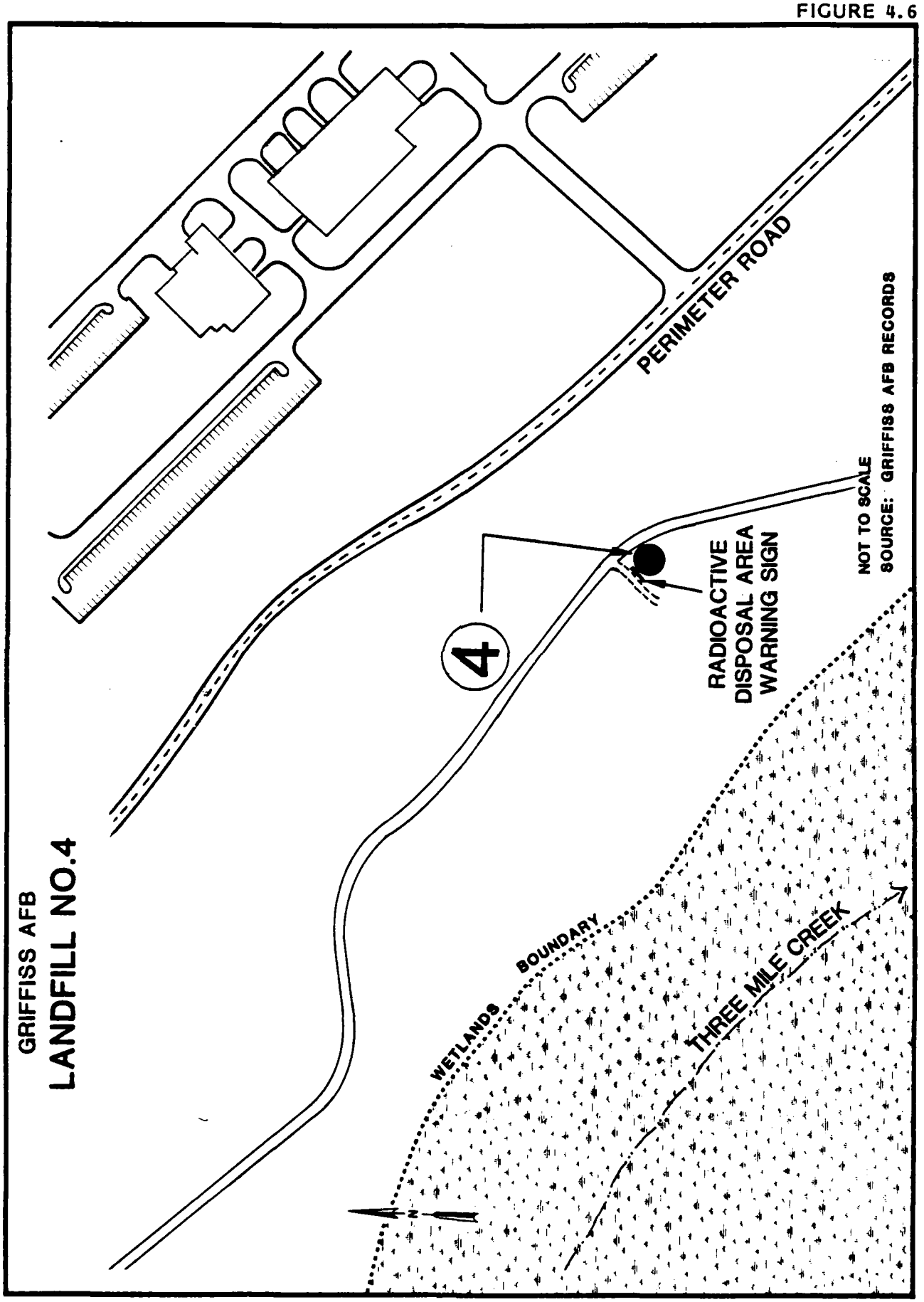
The location of Landfill No. 4 is shown in Figure 4.6. This landfill was used in the mid 1950's for disposal of low level radioactivity vacuum tubes. One person indicated that acid waste had been disposed of near this site. The site was initially an open vertical pipe four feet in diameter which was filled with concrete in 1977. The site drains 600 feet to Three Mile Creek which in turn flows another 4000 feet to the New York State Barge Canal. Tests of the air above the site indicate no radioactivity escape. There has been no ground water sampling for radioactivity in the area. A posted sign indicates a radioactive waste disposal site.

Landfill No. 5 is situated on about four acres near the intersection of Patrick Square Road and Perimeter Road (Figure 4.7). Patrick Square Road and an unnamed dirt access road border the site to the north and east, respectively. The landfill operated for about a year following the abandonment of Landfill No. 6 in 1959. The southern part of the site was constructed in the Three Mile Creek designated wetland area, and the site drains south to Three Mile Creek near its confluence with the New York State Barge Canal.

The landfill was constructed using an area type method to a total depth of about six feet. Wastes hauled to the site were burned at the landfill and then covered. A number of persons interviewed recalled underground fires that were difficult to extinguish. The site is now well vegetated in grass and small hardwoods, and to the southwest, the area is heavily wooded in medium to large hardwoods.

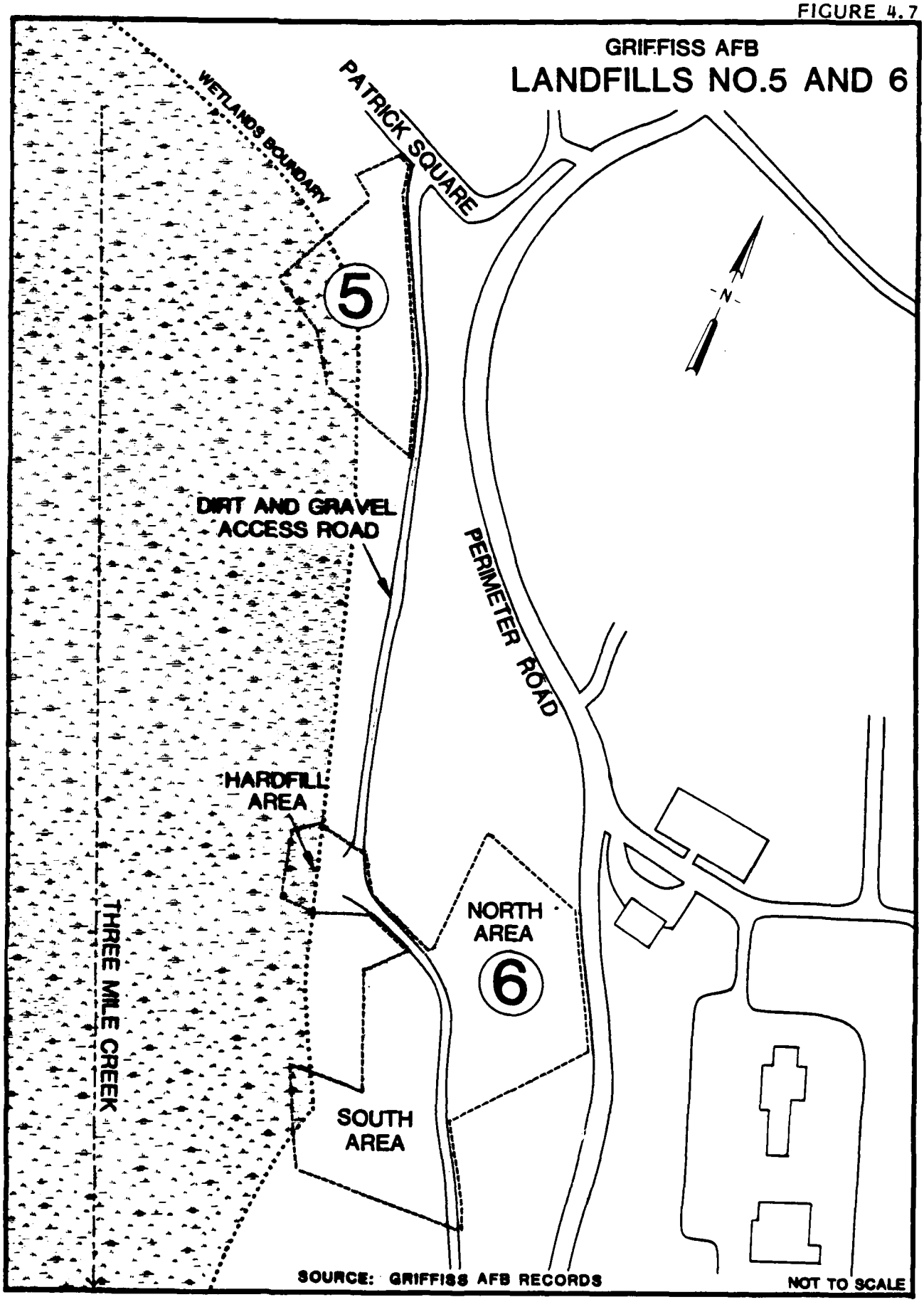
Landfill No. 6 is located on about eight acres between Perimeter Road and Three Mile Creek as shown on Figure 4.7. The landfill operated from 1955 until 1959, receiving hardfill (construction/demolition debris, wooden pallets, etc.) as well as municipal solid wastes (MSW)

FIGURE 4.6



ES ENGINEERING-SCIENCE

FIGURE 4.7



ES ENGINEERING-SCIENCE

and other base wastes. Hardfill was placed in a designated hardfill area on the western extremity of the site. The remaining area is physically divided by a dirt and gravel access road into a north area and a south area. The north area was constructed on a hillside with a ten percent slope, and wastes were dumped at the top of the hill and burned on the hillside. The thickeness of waste and burned residue on the hillside was estimated by one person to be five to ten feet. This area is now well vegetated with grass and small conifers and there is no visible evidence of leachate.

The south area lies on the opposite side of the dirt access road from the north area. Disposal in this area was accomplished by spreading wastes to an average depth of four feet and then covering. This area is flat and now stabilized in grass although the surface of the fill area has some small local depressions. The edge of the fill on the south side slopes down to the Three Mile Creek wetland area as designated on the "Base Comprehensive Plan."

Landfill No. 7 is located on about 4.5 acres to the east of the public runway observation point (Figure 4.8). This landfill was the first operated at Griffiss, opening in 1950 and closing in 1954. The landfill was operated using a trenching method with approximately four 20-foot deep trenches cut 50 to 60 feet wide and about 400 feet long, running parallel to the main runway. Waste collection vehicles entered the trenches alternately from one end and then the other from one day to the next. On any given day, one end of the trench would be in a waste burning phase while the other would be in a receiving phase. Persons interviewed recall liquid wastes being occasionally disposed of in the trenches. Liquids were buried in small pits dug in the bottom of the trenches.

When the landfill was closed, the area was vegetated with a thick grass cover. The surface now has numerous depressions and burrowing animal holes. Around the entrances to the burrows is evidence of charred wood and ashes apparently displaced from the waste material below. The site drains to a low area to the southeast which drains to Six Mile Creek. There was no evidence of leachate along the toe of fill, or surface ponding on the landfill cover. No fence, gates, signs or markers exist to indicate the location or extent of the landfill.

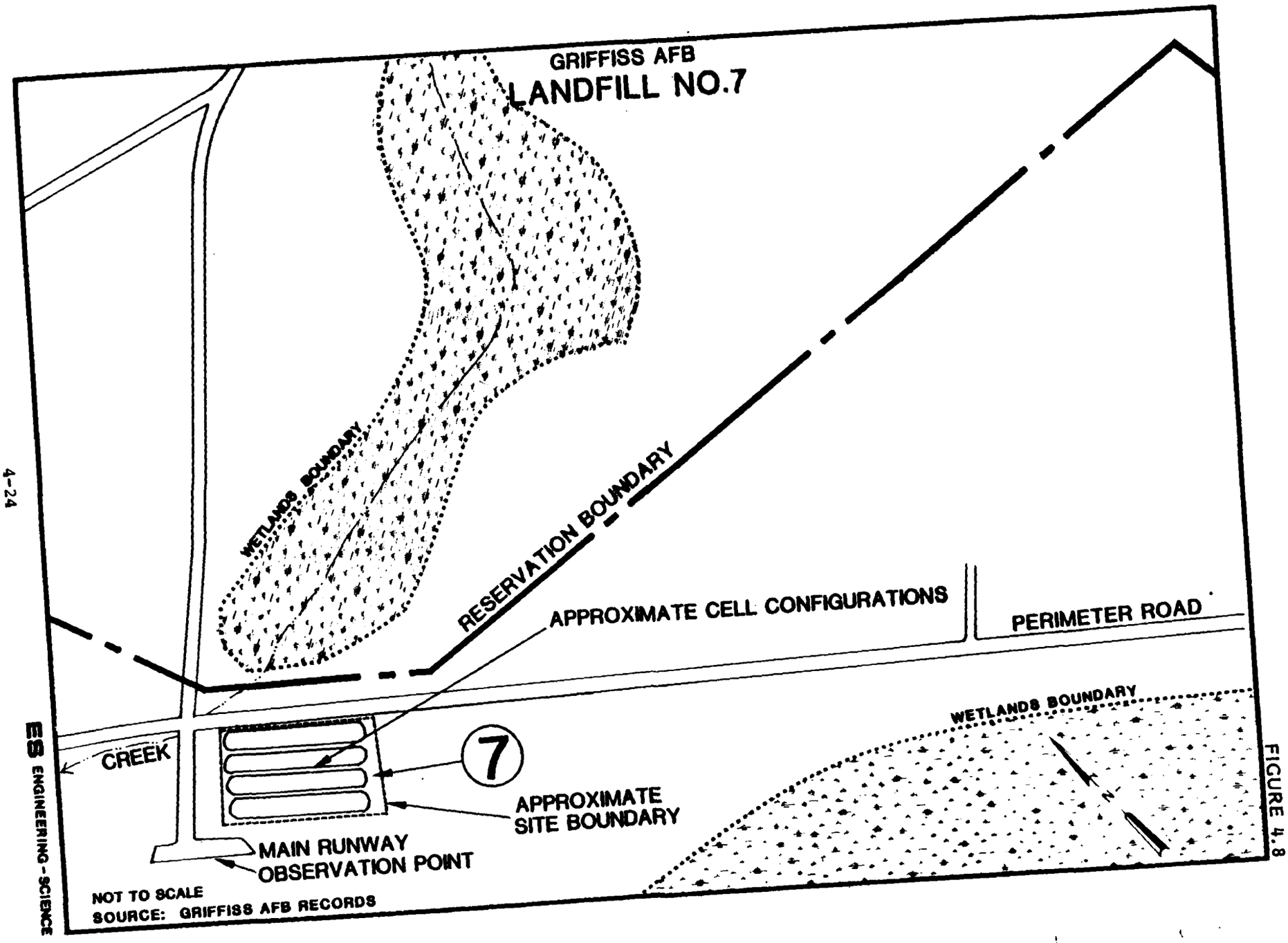


FIGURE 4.8

ES ENGINEERING-SCIENCE

Industrial Waste Treatment Facilities. Holding tanks are utilized at various locations on the base for gravity separation of oil/water and fuel/water mixtures. The locations of the gravity separators are identified on Figure 4.9 and information related to these units is summarized in Table 4.6. The liquid wastes collected in these gravity separators are disposed of off site by a waste oil disposal contractor.

Storm Sewer System. Figure 4.10 indicates the general drainage areas and approximate discharge points of the Griffiss storm sewer system. Most of the runoff from GAFB ultimately discharges to the New York State Barge Canal (the Erie Canal) either directly or through the Mohawk River, Six-Mile Creek, Three-Mile Creek or the City of Rome storm sewer. Runoff from the Wood Haven housing area, however, is directed to dry wells where it infiltrates to the subsurface water system. The storm sewer system has received effluent from some of the Base's gravity separation units and runoff from areas where hazardous material spills have occurred in the past.

Dry Wells. Figure 4.11 shows the location of a number of direct-disposal dry wells located in the industrial shop area. These wells are stone and gravel filled pits, roughly three or four feet square and ten feet deep.

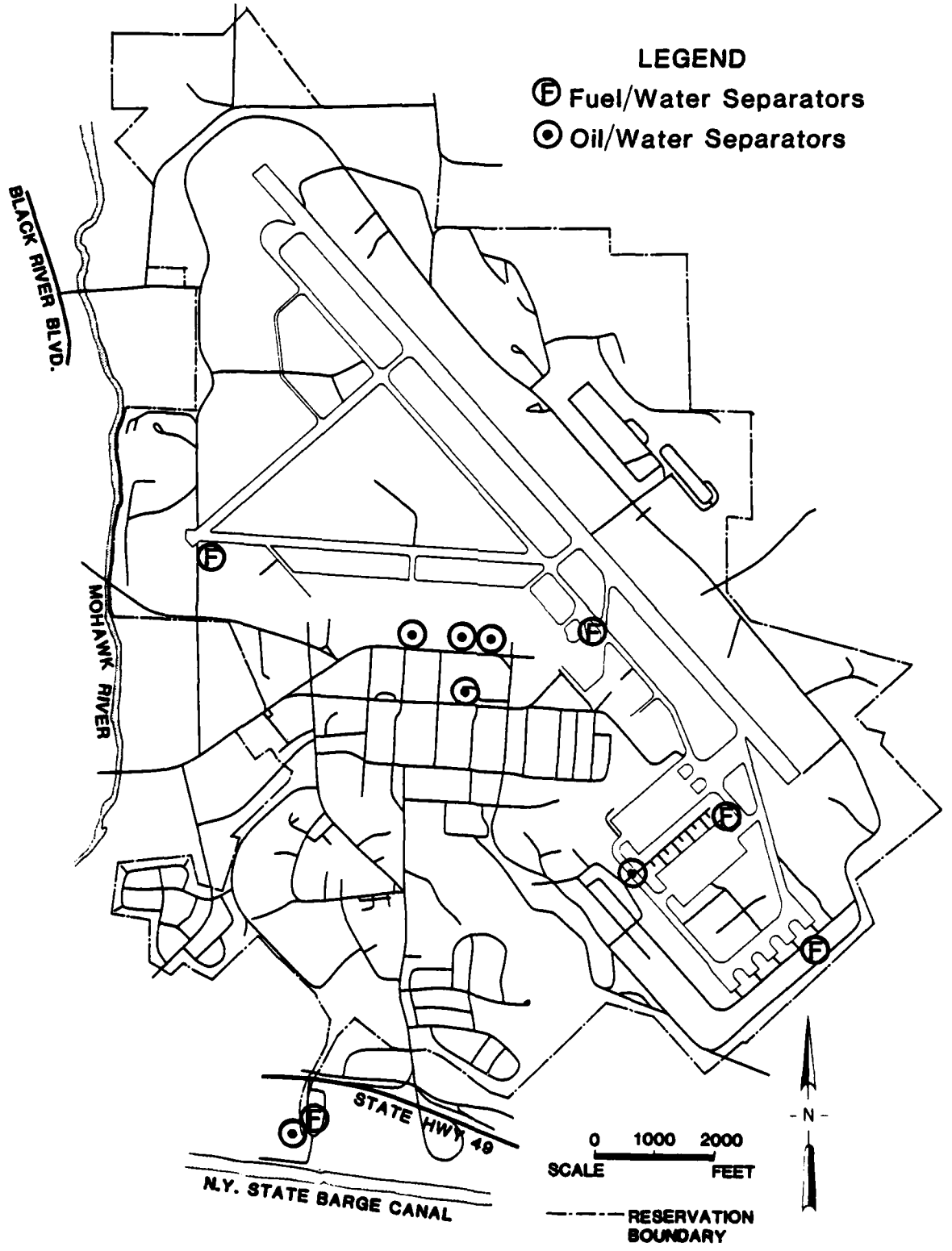
Liquid wastes, some of which are hazardous, have been placed in these dry wells and allowed to infiltrate directly to the ground-water system. Table 4.7 lists the active dry wells and summarizes information concerning the types and amounts of wastes disposed of through them.

Septic Tanks. There are over twenty septic tanks on base, serving facilities which are located too far from sanitary sewer lines to economically justify sewer-service connection. These units, however, are used primarily for disposal of sanitary sewerage.

"Yellow Submarine" Holding Tank. Plating and stripping rinses and wastes flow into floor drains at the plating shop (Bldg. 101). These drains lead to a half-buried holding tank (labeled the "yellow submarine") located just outside this building, near the shop. This tank is internally recirculated and is also fed by six sink drains in the area, thereby providing a dilution effect for the plating shop wastes. The tank effluent flows to the sanitary sewer.

GRIFFISS AFB

FUEL/WATER AND OIL/WATER SEPARATORS



SOURCE: GRIFFISS AFB STORM DRAINAGE AND SANTARY SEWERAGE SYSTEMS, SEPT., 1980

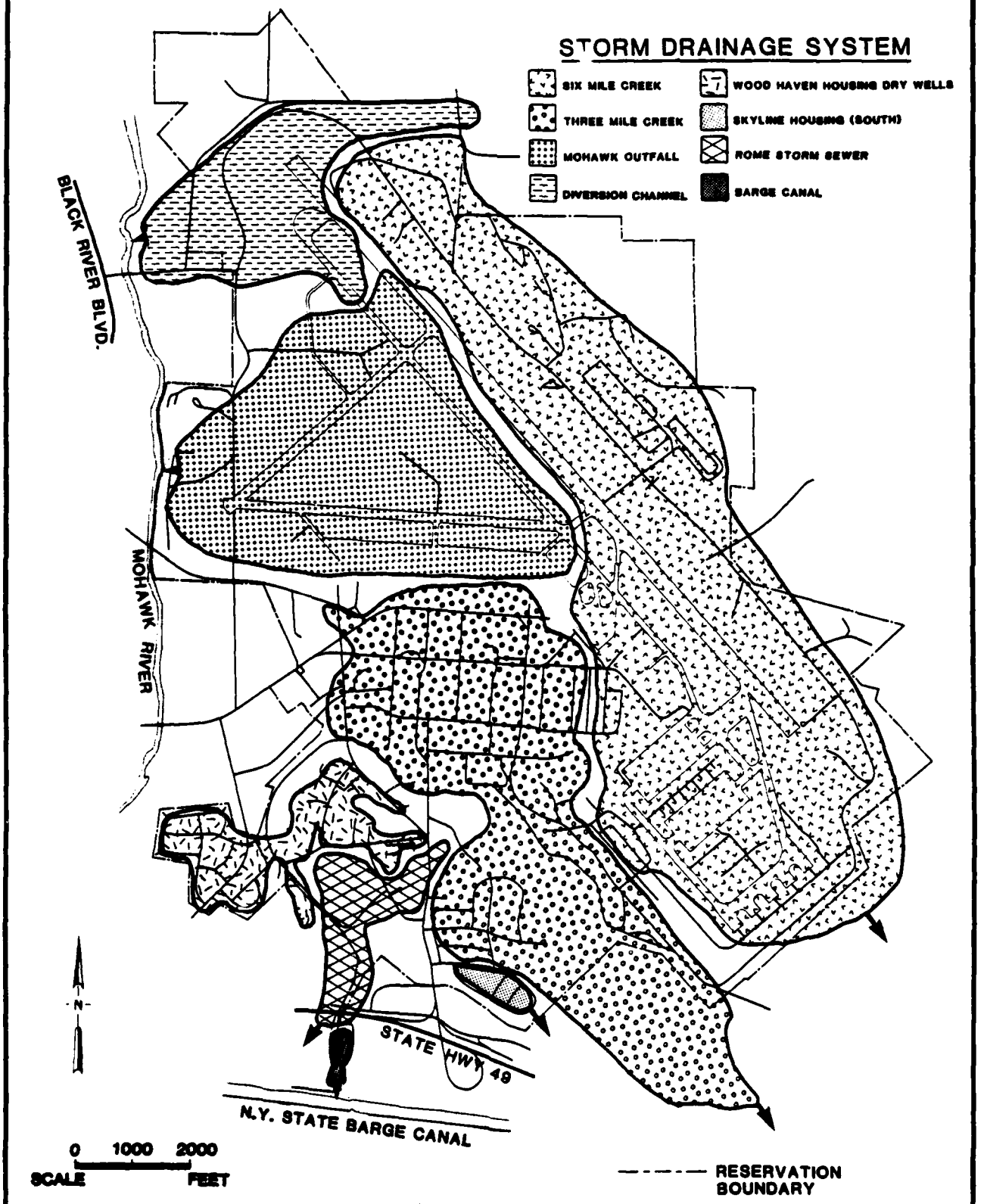
Table 4.6
GAFB GRAVITY SEPARATION TREATMENT UNITS

Location	Separator Type	Number of Separators	Influent Source	Discharge Point
Building 101	oil/water	2	Floor washdown from propulsion and engine repair shops.	Sanitary sewer
POL area at Barge Canal	fuel/water	1	Runoff and washdown from diked fuel storage area.	Sanitary sewer
	oil/water	1	Runoff and washdown from truck loading/unloading area.	Storm sewer to Barge Canal
SAC area	oil/water	1	Runoff and washdown from SAC area. Waste fuel from Fuels Laboratory.	Sanitary sewer
Building 100	oil/water	1	Runoff from surrounding area and Building 100 floor washdown.	Sanitary sewer
Steam plant	oil/water	1	Runoff and washdown from fuel oil unloading area. Floor washdown from motor pool, auto hobby shop and BX service station.	Storm sewer
Runway area	fuel/water	4	Runoff from runways.	Storm sewer

FIGURE 4.10

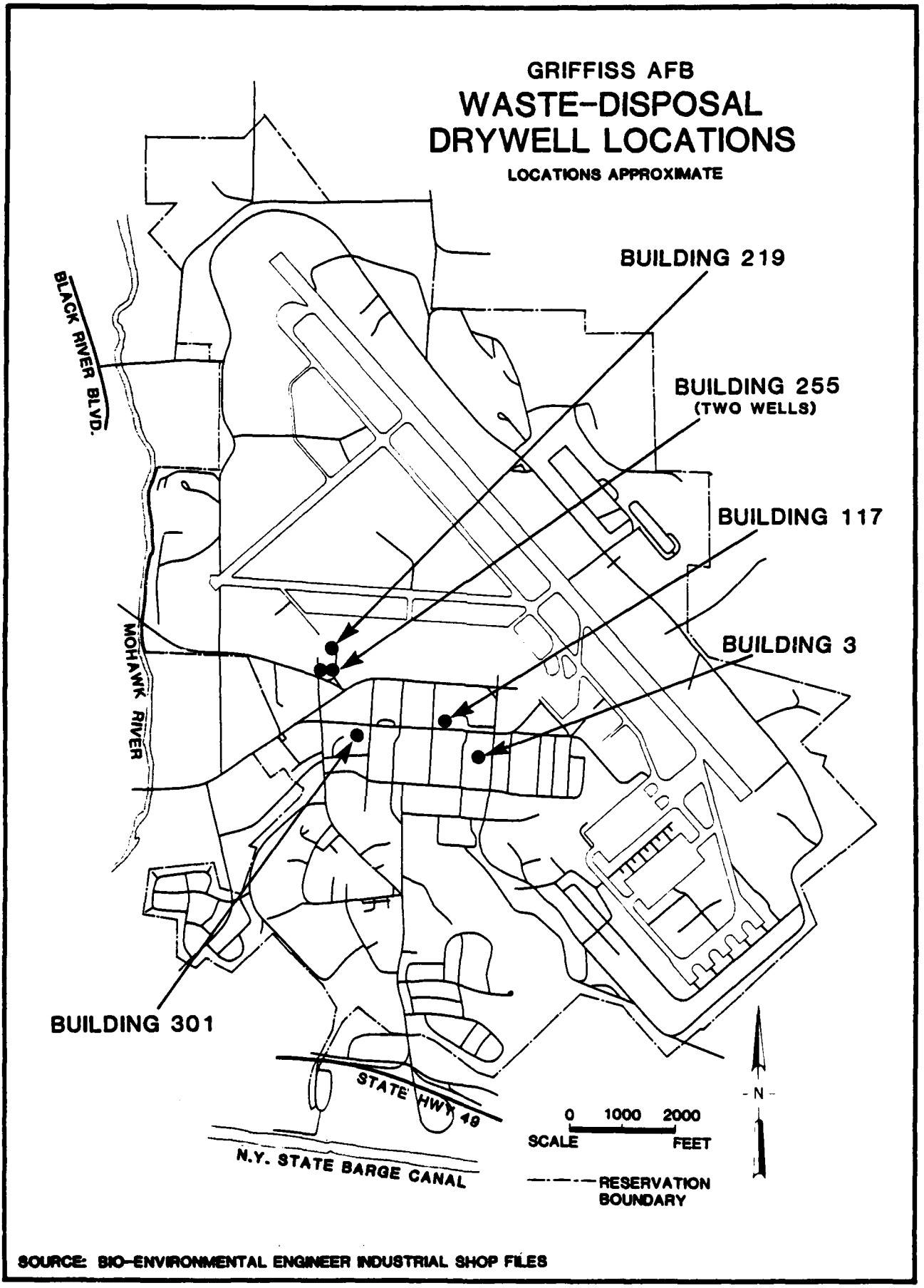
GRIFFISS AFB

STORM DRAINAGE PATTERNS



SOURCE: GRIFFISS AFB STORM SEWERAGE SYSTEM, SEPT., 1980

FIGURE 4.11



SOURCE: BIO-ENVIRONMENTAL ENGINEER INDUSTRIAL SHOP FILES

TABLE 4.7

GAFB DRY WELL DISPOSAL UNITS

Well Location	Wastes Disposal	Waste Classification*	Estimated Quantity
Building 3	o cleaning solvents	H	1-5 gal/day
	o etching acids and solutions containing metal salts	H	<2 gal/day
	o paint thinner (small amount)	H	<1 gal/day
Building 117	o boiler blowdown	NH	<20 gal/day
	o zeolite ion exchange rinse	NH	<5000 gal/mo
Building 219	o battery acids (neutralized)	H	<1 gal/day
	o electrical power production shop floor wash	PH	<100 gal/mo
	o ethylene glycol (antifreeze)		
Building 255	o lube oil	H	
	o engine cleaning compounds	H	<5 gal/day
	o caustic and acids	H	
	o paint (small amount)	PH	
Building 301	o pesticide container wash	H	<1 gal/day
	o excess or off-spec pesticide	H	<2 gal/yr

*H - probably hazardous
NH - probably non-hazardous
PH - potentially hazardous depending on contaminants

Off-Site Disposal Methods

The methods used for disposal of GAFB hazardous and non-hazardous wastes include:

- City of Rome Wastewater treatment plant (WWTP)
- Off-site waste oil contract disposal
- Off-site refuse waste contract disposal

City of Rome WWTP. With the exception of drummed wastes sent to an off-site contractor, wastes disposed of in septic tanks and the wastes disposed of in the on-site dry wells, all sanitary and industrial aqueous wastes go to the City of Rome WWTP through a sanitary sewer system. This WWTP was designed for 9 MGD and serves approximately 45,000 people. There are, however, inflow and infiltration problems and the actual average flow is above 10 MGD (peak flow is 14 MGD). The plant has high oils and grease loadings.

Off-Site Waste Oil Contractor. Most waste oil and fuel generated on site is drummed and placed in specific holding areas. An off-site, private contractor pumps this waste liquid into a tank truck on a regular basis and hauls the waste for disposal in an incinerator. The contractor checks the fuel/water and oil/water separators and withdraws floating wastes as necessary. At present the off-site contractor hauling and disposing of the GAFB waste oil and fuel is Williamstown Irrigation, Inc. of Williamstown, New York. Table 4.8 summarizes information concerning the wastes disposed of through off-site contractors.

Off-site Refuse Waste Contractor. An off-site, private contractor makes periodic rounds on GAFB, collecting the non-hazardous, general refuse and garbage from the dumpsters located on the base. The current contract for general refuse waste disposal is held by Onondaga Environmental Systems, Inc, East Syracruse, New York. The method of disposal is sanitary landfilling. Table 4.9 summarizes information concerning the wastes disposed of as non-hazardous in the off-site landfill.

Liquid Hazardous Wastes. As previously described, all hazardous liquid wastes are consigned to DPDO and stored at Lot 69. No disposal method has been arranged for for these wastes. Table 4.10 provides a partial listing of the liquids in storage.

TABLE 4.8

WASTE OIL INFORMATION

Wastes Removed by Contractor Include:

- Waste Fuels (Mogas, JP-4)
- Waste oil

Total Quantity of Waste

- 1000 - 1300 gal/month

Contractors

Williamstown Irrigation Williamstown, New York, 13493	July 79-current
Oldover Corp. P. O. Box 2 Saugerties, NY 12477	July 78 - June 79
Berks Associates, Inc. P. O. Box 305 Douglasville, PA 19518	July 77 - June 78
Norco P. O. Box 338 Bayonne, NY 07002	July 76 - June 77
Berks Associates	August 75 - June 76

TABLE 4.9

OFF-SITE NON-HAZARDOUS WASTE INFORMATION

Wastes Removed by Contractor include:

- Waste soot from Steam Plant Firebox (1 truckload/yr)
- Speedi-dry material (varies)
- Small amounts of asphalt coatings (<1 gal/day)
- Various cements and glues (<1 gal/day)
- Triple-rinsed pesticide containers (<1 container/day)
- Oily rags (varies)
- Solvent-contaminated rags (varies)
- Photocopy wastes (varies)
- Plastic dust (varies)
- Hardened or waste powdered resins (varies)
- Solidified chemicals from etching room sinktraps (<1 lb/day)
- Quick start cartridge (Ammonium Nitrate) (50/month)
- General refuse and domestic wastes (varies)

Current Contractor

Onondaga Environmental Systems, Inc.

East Syracuse, New York 13057

TABLE 4.10

PARTIAL LISTING OF HAZARDOUS WASTES IN STORAGE

- Methanol
- Acetone
- 1,1,1-trichloroethane
- Trichloroethylene
- Dye penetrants and soaps
- Greases
- Isopropyl alcohols
- Degreasers
- Solvents
- Cleaners
- Methyl ethyl ketone
- Toluene

EVALUATION OF PAST WASTE DISPOSAL FACILITIES

Landfills

Waste disposal by on-site landfilling has been practiced at seven locations on the base property. All of the locations, with the exception of Landfill No. 2, are presently inactive. Major activity at Landfill No. 2 ceased in 1980 but this site is still used to dispose of small amounts of waste from incoming overseas aircraft.

During the landfill site visits, a number of evident and potential problems were identified. These problems are noted on Table 4.4 and summarized in Table 4.11, and briefly discussed below.

Detailed geologic and hydrogeologic information was not available for the seven landfill sites. However, available soils information, indicates that several of the landfills are located in relatively permeable soil types. Permeable soils, in general, are not desirable for landfill siting since they allow rapid movement of liquid wastes and/or leachate and can provide an avenue for contamination of the ground-water system.

Visable leachate flows were observed in the vicinity of Landfill No. 1. The flow has been estimated to be about 3 to 7 gpm and enters Six Mile Creek. Water quality tests indicate the contamination of the creek by landfill leachate.

Wastes which have been uncovered due to excavation or exposed by erosion were observed at Landfill Nos. 1 and 2. Uncovered wastes can contribute to contamination of surface runoff.

Depressions in a landfill cover due to inadequate grading or subsidence can provide points for surface water ponding and increased infiltration. This is undesirable because it promotes rain water infiltrate through the waste and can increase leachate generation. Depressions were observed at Landfill Nos. 2, 6 and 7 during the site visits.

Landfill Nos. 2 and 3 were found to have incomplete plant cover during the site visits. Plant growth is beneficial because it tends to stabilize the soil surface and prevents erosion from exposing the buried wastes.

Two of the seven landfills are known to contain hazardous wastes. Landfill No. 3 was used to dispose of asbestos insulation and Landfill No. 4 was used to dispose of low level radioactive wastes. Although the

4.11

PROBLEMS IDENTIFIED AT GAFB LANDFILLS

	Landfill Located in permable soil types	Visable Leachate flows	Uncovered or exposed wastes	Insufficient grading for drainage (ponding)	Insufficient plant cover for soil stabilization	Past Disposal of hazardous wastes
Landfill 1	X	X	X			X
Landfill 2	X		X	X	X	INA
Landfill 3	X				X	S
Landfill 4	P					S
Landfill 5	P					INA
Landfill 6	P			X		INA
Landfill 7	X			X		INA

Notes: 1. "X" indicates confirmed and documented observation.
2. INA = information not available to confirm.
3. "S" indicates a suspected but undocumented problem.
4. "P" indicates that these sites are probably constructed in permeable soils.

other landfill areas may contain wastes with hazardous characteristics, recorded information is not available to confirm this. At any site where hazardous wastes have been landfilled there is the possibility that harmful contamination of the ground-water system has occurred or will occur at some future time.

Dry Wells

At a number of locations on the GAFB property dry wells are used for disposal of hazardous and non-hazardous liquid wastes. These dry wells consist of pits filled with gravel where liquid wastes are placed and allowed to infiltrate into the subsurface soils. Dry well disposal procedures used at GAFB may have contributed to contamination of the ground-water system. If this were the case, ground water monitoring would be necessary to define the extent of this contamination and to assess the impacts that have or will occur on local ground water users.

Rating of Waste Disposal Sites

Nineteen disposal sites associated with GAFB were identified as containing hazardous material resulting from past waste disposal activities. These sites have been assessed using a rating system which takes into account factors such as site characteristics, waste characteristics, potential for contamination and waste management practices. The details of the rating procedure are presented in Appendix B and the results of the assessment are summarized in Table 4.12. Rating scores were developed for the individual sites and the sites are listed in order of ranking. The rating system is designed to indicate the relative need for more detailed site assessment and/or remedial action. The information presented in Table 4.12 should be used as a guide for assigning priorities for dealing with the GAFB disposal sites. The rating forms for the individual waste disposal sites are presented in Tables 4.13 through 4.31.

TABLE 4.12
PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

Rank	Site Name	Receptor		Pathways		Waste Characteristics	Waste Management			Overall	
		% Assumed	Subscore	% Assumed	Subscore	Subscore	% Assumed	% NA or Missing	Subscore	% Assumed	Score
1	Landfill No. 1	0.	80	10.	81	100	22.	0.	69	12.	81
2	Landfill No. 2	0.	75	30.	64	70	22.	0.	93	20.	75
3	Landfill No. 7	0.	75	30.	53	80	22.	0.	73	20.	68
4	Bulk Fuel Storage Area	0.	67	20.	61	60	0.	33.	44	8.	58
5	Lindane Spill at Former Entomology Storage Bldg.	0.	27	20.	69	80	0.	22.	53	8.	57
6	Yellow Submarine Holding Tank, Bldg. 101	0.	31	20.	61	60	0.	67.	69	8.	56
7	Landfill No. 5	0.	57	20.	40	70	22.	0.	61	16.	55
8	PCB Dump Area, Bldg. 112	0.	27	20.	47	70	11.	22.	72	12.	53
(9)	Landfill No. 6	0.	47	20.	38	70	22.	0.	61	16.	52
(9)	Drywell, Steam Plant, Bldg. 117	0.	29	20.	43	80	11.	44.	66	12.	52
11	Drywell, Bldg. 3	0.	27	20.	46	80	22.	44.	51	16.	51
12	Drywell, Entomology, Bldg. 301	0.	24	20.	48	80	0.	44.	57	8.	50
13	Two Drywells, Bldg. 255	0.	24	20.	46	80	22.	44.	57	16.	49
(14)	General Chlordane Application	0.	57	20.	42	60	0.	44.	32	8.	46
(14)	Drywell, Bldg. 219	0.	24	20.	46	60	22.	44.	57	16.	46
(14)	PCB Spill at Floyd	0.	31	20.	60	70	11.	33.	26	12.	46
17	Hazardous Waste Storage Area, Lot 69	0.	27	20.	64	60	11.	33.	27	12.	38
18	Waste Oil Storage Area, Bldg. 101	0.	27	20.	26	50	0.	44.	48	8.	36
19	PCB Transformer Leak, Bldg. 112	0.	27	20.	30	50	0.	67.	27	8.	32

Note: This ranking was performed according to the Hazard Evaluation Methodology described in Appendix B.

TABLE 4.13

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Landfill No. 1 (Inactive)

Location: North of Small Arms Range

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	3	12	36	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	111	138
Percentage of Assumed Values = 0 %		SUBSCORE		80
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	2	6	12	18
Soil Permeability	3	6	18	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	3	4	12	12
Number of Assumed Values = 1 Out of 10		SUBTOTALS	167	195
Percentage of Assumed Values = 10 %		SUBSCORE		81
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.13 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 100

Reason for assigned Hazardous Rating:

Interviews revealed presence of large quantities of hazardous waste

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	3	4	12	12
Waste Incompatibility	2	3	6	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	2	6	12	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	1	8	8	24
Subsurface Flows	1	7	7	21

Number of Assumed Values = 2 Out of 9

Percentage of Assumed Values = 22%

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 0%

SUBTOTALS 104 150

SUBSCORE 69

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12%

OVERALL SCORE 31

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.14

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site: Landfill No. 2 (in limited use)

Location: North of LOX Facility

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	103	138
Percentage of Assumed Values = 0 %		SUBSCORE		75
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	2	4	8	12
Surface Erosion	3	4	12	12
Number of Assumed Values = 3 Out of 10		SUBTOTALS	125	135
Percentage of Assumed Values = 30 %		SUBSCORE		64
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 3 %				

TABLE 4.14 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for assigned Hazardous Rating:
Information from interviews

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	3	4	12	12
Waste Incompatibility	2	3	6	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	3	8	24	24
Subsurface Flows	1	7	7	7
		SUBTOTALS	126	136
		SUBSCORE		93

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 5 Out of 25
Overall Percentage of Assumed Values = 20 %

OVERALL SCORE 75

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.15

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Landfill No. 7 (Inactive)

Location: East of Runway

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	28
Number of Assumed Values = 0 Out of 6		SUBTOTALS	103	138
Percentage of Assumed Values = 0 %		SUBSCORE		75
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	2	4	8	12
Number of Assumed Values = 3 Out of 10		SUBTOTALS	104	195
Percentage of Assumed Values = 30 %		SUBSCORE		53
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.15 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 80

Reason for Assigned Hazardous Rating:
Information from interview

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	2	3	6	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	1	7	7	21
		SUBTOTALS	110	150
		SUBSCORE		73

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 5 Out of 25
Overall Percentage of Assumed Values = 20 %

OVERALL SCORE 68

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.16

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Bulk Fuel Storage Area

Location: Barge Canal

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	2	4	8	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	92	138
Percentage of Assumed Values = 0 %		SUBSCORE		67
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	119	195
Percentage of Assumed Values = 20 %		SUBSCORE		61
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.16 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:
Spills in area have been recorded

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	1	7	7	21
Hazardous Waste Quantity	1	7	21	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	1	6	6	18
Use of Leachate Collection System	1	6	6	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 3 Out of 9
Percentage of Missing and Non-Applicable Values = 33 %

SUBTOTALS 44 99
SUBSCORE 44
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 58
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.17

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Former Entomology Storage Shed (Building razed) Lindane Spill Area

Location: Adjacent to Building 321

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	3	15	45	45
Type of Contamination, Soil/Biota	3	5	15	15
Distance to Nearest Surface Water	0	4	0	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	134	195
Percentage of Assumed Values = 20 %		SUBSCORE		69
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.17 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 30

Reason for Assigned Hazardous Rating:

55 gallon Lindane Spill is known to have occurred here.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	3	8	24	24
Subsurface Flows	-	7	-	-
		SUBTOTALS	77	144
		SUBSCORE		53

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 2 Out of 9

Percentage of Missing and Non-Applicable Values = 22 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 57

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.18

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Yellow Submarine Holding Tank

Location: Building 101

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	18
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	43	138
Percentage of Assumed Values = 0 %		SUBSCORE		31
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	-	4	-	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	119	195
Percentage of Assumed Values = 20 %		SUBSCORE		61
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

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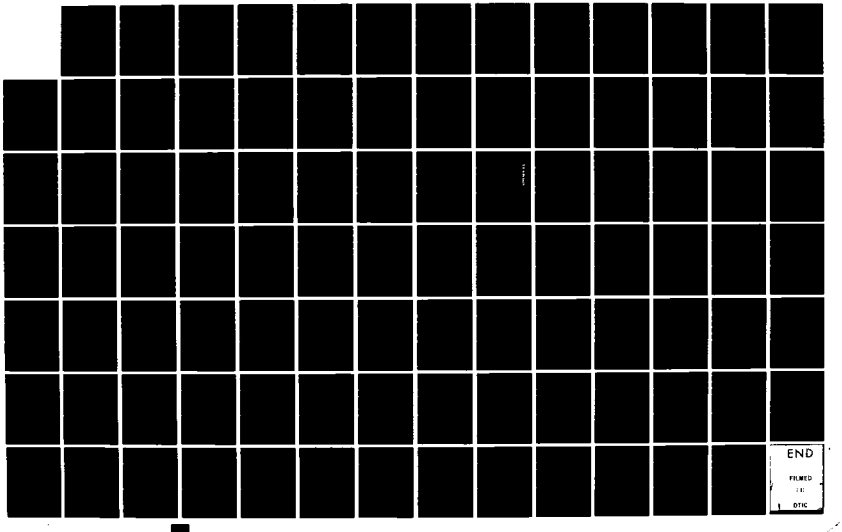

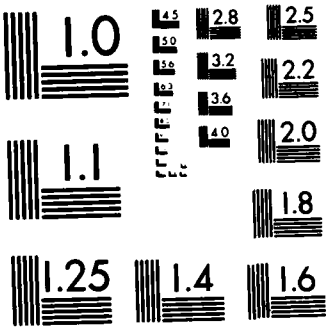

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE 4.18. (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:
Information from interviews

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	-	6	-	-
Use of Leachate Collection System	-	6	-	-
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-
		SUBTOTALS	35	51
		SUBSCORE		69

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 6 Out of 9
Percentage of Missing and Non-Applicable Values = 67 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 56

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.19

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Landfill No. 5

Location: South of Area 24

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	3	12	36	36
Water Quality of Nearby Surface Water Body	2	6	12	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	79	138
Percentage of Assumed Values = 0 %		SUBSCORE		57
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	0	10	0	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	78	195
Percentage of Assumed Values = 20 %		SUBSCORE		40
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.19 (Continuted)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:
Information from interview

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	1	8	8	24
Subsurface Flows	0	7	0	21

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

SUBTOTALS 92 150
SUBSCORE 61
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 55
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.20

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site PCB Dump Area

Location High Power Lab, Building 112

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	92	195
Percentage of Assumed Values = 20 %		SUBSCORE		47
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.20 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:
Information from interviews

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	3	8	24	24
Subsurface Flows	-	7	-	-
		SUBTOTALS	88	123
		SUBSCORE		72

Number of Assumed Values = 1 Out of 9
Percentage of Assumed Values = 1 %
Number of Missing and Non-Applicable Values = 2 Out of 9
Percentage of Missing and Non-Applicable Values = 22 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 53

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.21

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site Landfill No. 6

Location West of SAC Area

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	2	4	8	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	65	138
Percentage of Assumed Values = 0 %		SUBSCORE		47
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	0	10	0	30
Level of Water Contamination	0	15	0	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	2	4	8	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	75	195
Percentage of Assumed Values = 20 %		SUBSCORE		38
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.21 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
[illegible]	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:
Information from interviews

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	1	4	4	12
Waste Incompa ibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	1	8	8	24
Subsurface Flows	0	7	0	21

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicalbe Values = 0 %

SUBTOTALS 92 150
SUBSCORE 61
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 52
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.22

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Drywell, Central Steam Plant, Building 117

Location: Main Base Area

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	2	6	12	18
		SUBTOTALS	39	138
Number of Assumed Values = 0 Out of 6		SUBSCORE		28
Percentage of Assumed Values = 0 %		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Number of Missing Values = 0 Out of 6				
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
		SUBTOTALS	84	195
Number of Assumed Values = 2 Out of 10		SUBSCORE		43
Percentage of Assumed Values = 20 %		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Number of Missing Values = 0 Out of 10				
Percentage of Missing Values = 0 %				

TABLE 4.22 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 80

Reason for Assigned Hazardous Rating:
Drywell usage is well documented.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	0	7	0	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-
		SUBTOTALS	57	87
		SUBSCORE		66

Number of Assumed Values = 1 Out of 9
Percentage of Assumed Values = 11 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicalbe Values = 44 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Numbe. of Assumed Values = 3 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 82

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.23

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Drywell, Building 3, Rooms 91, 98, 64A and B and Machine Fabrication Shop

Location: RADC Building

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	39	195
Percentage of Assumed Values = 20 %		SUBSCORE		96
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.23 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 80

Reason for Assigned Hazardous Rating:

Drywell usage has been well documented

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 2 Out of 9

Percentage of Assumed Values = 22 %

Number of Missing and Non-Applicable Values = 4 Out of 9

Percentage of Missing and Non-Applicable Values = 44 %

SUBTOTALS 53 97

SUBSCORE 61

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25

Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 51

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.24

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Entomology Shop Building 301

Location: Civil Engineering Office

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
		SUBTOTALS	33	138
		SUBSCORE		24

Number of Assumed Values = 0 Out of 6
Percentage of Assumed Values = 0 %
Number of Missing Values = 0 Out of 6
Percentage of Missing Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	3	5	15	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
		SUBTOTALS	94	195
		SUBSCORE		48

Number of Assumed Values = 2 Out of 10
Percentage of Assumed Values = 20 %
Number of Missing Values = 0 Out of 10
Percentage of Missing Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

TABLE 4.24 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 30

Reason for Assigned Hazardous Rating:
Drywell usage is documented.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-
		SUBTOTALS	50	87
		SUBSCORE		57

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicable Values = 44 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 9 %

OVERALL SCORE 50

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.25

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Two Drywells, Transportation Vehicle Maintenance Building 255

Location: Main Base Area

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	33	138
Percentage of Assumed Values = 0 %		SUBSCORE		24
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	89	195
Percentage of Assumed Values = 20		SUBSCORE		46
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.25 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 80

Reason for Assigned Hazardous Rating:
Drywell usage is well documented.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	0	0
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicalbe Values = 44 %

SUBTOTALS 50 87
SUBSCORE 57
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 49
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.26

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: General Chlordane Application

Location: All buildings around base

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	79	138
Percentage of Assumed Values = 0 %		SUBSCORE		57
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
PATHWAYS				
Evidence of Water Contamination	0	10	0	30
Level of Water Contamination	0	15	0	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	8	195
Percentage of Assumed Values = 20 %		SUBSCORE		42
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.26 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: *Judgemental rating from 30 to 100 points based on the following guidelines:*

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Information from Entomology Shop Files

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	1	7	7	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	2	6	12	18
Use of Leachate Collection System	-	6	-	-
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-
		SUBTOTALS	26	81
		SUBSCORE		32

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicable Values = 44 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 46

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.27

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Drywell, Power Plant, Building 219

Location: Main Base Area

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	33	138
Percentage of Assumed Values = 0 %		SUBSCORE		24
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	89	195
Percentage of Assumed Values = 20 %		SUBSCORE		46
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.27 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:
Spills of fuel oil are known to have occurred.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicable Values = 44 %

SUBTOTALS 50 87
SUBSCORE 57
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 46

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.28

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: PCB Spill Area

Location: Floyd Test Annex

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	43	138
Percentage of Assumed Values = 0 %		SUBSCORE		31
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	8	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	117	195
Percentage of Assumed Values = 20 %		SUBSCORE		60
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.28 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:

Information from reports and interviews

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	1	7	7	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	2	6	12	18
Use of Leachate Collection System	0	6	0	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-
		SUBTOTALS	26	99
		SUBSCORE		26

Number of Assumed Values = 1 Out of 9

Percentage of Assumed Values = 11 %

Number of Missing and Non-Applicable Values = 3 Out of 9

Percentage of Missing and Non-Applicable Values = 33 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 46

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.29

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: Hazardous Waste Liquid Storage Area

Location: Lot 69

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	3	15	45	45
[illegible] of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	124	145
Percentage of Assumed Values = 20 %		SUBSCORE		64
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.29 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:
Information from records and interviews.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	1	7	7	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	2	3	6	9
Absence of Liners or Confining Beds	1	6	6	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 1 Out of 9
Percentage of Assumed Values = 11 %
Number of Missing and Non-Applicable Values = 3 Out of 9
Percentage of Missing and Non-Applicalbe Values = 11 %

SUBTOTALS 27 99
SUBSCORE 27
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 39

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.30

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site: Waste Oil Storage Area

Location: Building 101

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	0	10	0	30
Level of Water Contamination	0	15	0	45
Type of Contamination, Soil/Biota	0	5	0	15
Distance to Nearest Surface Water	0	4	0	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	50	195
Percentage of Assumed Values = 20 %		SUBSCORE		26
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.30 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
-	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Information from interviews.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	-	6	-	-
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	-	7	-	-

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 4 Out of 9
Percentage of Missing and Non-Applicable Values = 44 %

SUBTOTALS 39 81
SUBSCORE 48
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 36
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

TABLE 4.31

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site: PCB Rooftop Transformer

Location: High Power Lab, Building 112

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	37	138
Percentage of Assumed Values = 0 %		SUBSCORE		27
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	0	10	0	30
Level of Water Contamination	0	15	0	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	2	6	12	18
Soil Permeability	2	6	12	18
Bedrock Permeability	2	4	8	12
Depth to Bedrock	1	4	4	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	59	195
Percentage of Assumed Values = 20 %		SUBSCORE		30
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

TABLE 4.31 (Continued)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Observation of leak but lack laboratory analysis

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	-	4	-	-
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	-	6	-	-
Use of Leachate Collection System	-	6	-	-
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Surface Flows	-	7	-	-

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 6 Out of 9
Percentage of Missing and Non-Applicable Values = 67 %

SUBTOTALS 14 51
SUBSCORE 28
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 32
(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

CHAPTER 5

CONCLUSIONS

CHAPTER 5

CONCLUSIONS

The goal of Phase I of the IRP was to identify the potential for environmental contamination from past waste disposal practices at Griffiss AFB and to assess the probability of contamination migration beyond the base boundaries. Based on the results of the project team's one week field inspection, review of records and files, and interviews with base personnel, past employees and state and local government employees, the following conclusions have been developed. The conclusions are listed by category. Table 5.1 contains the priority ranking of potential contamination sources at Griffis AFB.

1) Landfill Areas

   a) Landfill No. 1 creates the greatest potential for off-site migration of contaminants. Surface contamination by leachate from the landfill to Six Mile Creek has been identified and ground water contamination may also be occurring. See Tables 4.5, 4.11, 4.13 and 5.1 for more complete information.

   b) Other landfills (No.'s 2, 7, 5 and 6 ranked in descending priority) may present potential contamination problems due to construction techniques used (no liner), location (wetland areas, permeable soils), unknown nature of waste materials (incomplete records), and incomplete closure (inadequate cover and drainage). See Tables 4.5, 4.11, 4.14, 4.15, 4.19, 4.21 and 5.1 for more detailed information on these sites.

2) Drywells

   a) Drywells at Buildings 117, 3, 301, 225 and 219 (ranked in descending priority) have been used to dispose of hazardous materials which may have resulted in ground-water contamination. See Tables 4.7, 4.22, 4.23, 4.24, 4.25, 4.27 and 5-1 for more complete information.

3) Spill Areas

   a) The Lindane spill area (Former Entomology storage building), the PCB spill area at the Floyd annex and the PCB dump area at

TABLE 5.1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

Rank	Site Name	Site Evaluation Score %
1	Landfill No.1	81
2	Landfill No.2	75
3	Landfill No.7	68
4	Bulk Fuel Storage Area	58
5	Lindane Spill at Former Entomology Storage Bldg.	57
6	Yellow Submarine Holding Tank, Bldg. 101	56
7	Landfill No.5	55
8	PCB Dump Area, Bldg. 112	53
(9)	Landfill No.6	52
(9)	Drywell, Steam Plant, Bldg. 117	52
11	Drywell, Bldg. 3	51
12	Drywell, Entomology, Bldg. 301	50
13	Two Drywells, Bldg. 225	49
(14)	General Chlordane Application	46
(14)	Drywell, Bldg. 219	46
(14)	PCB Spill at Floyd	46
17	Hazardous Waste Storage Area, Lot 69	38
18	Waste Oil Storage Area, Bldg. 101	36
19	PCB Transformer Leak, Bldg. 112	32

Note: This ranking was performed according to the Hazard Evaluation Methodology described in Appendix B.

Building 112 exhibit a potential for contamination of ground water (See Tables 4.17, 4.20, 4.28 and 5.1).

b) The storage area of liquid hazardous waste (Lot 69) has had small spills in the past and does not provide containment (seepage), or security (fence)(See Tables 4.29 and 5.1).

4) Water Wells

a) On-base water wells could become contaminated by leachate production from the landfills.

5) Sanitary Sewer

a) A number of wastes, including the Plating Shops wastes via the Yellow Submarine Holding Tank, enter the sanitary sewer system. Under Section 261.4(a)(1)(ii) of 40 CFR, these wastes are not defined as RCRA hazardous wastes.

CHAPTER 6

RECOMMENDATIONS

CHAPTER 6

RECOMMENDATIONS

In order to aid in the comparison of these nineteen sites with those sites identified in the IRP at other Air Force Bases, a priority ranking scale has been developed. Those sites with overall scores of 80 to 100 are in the First Priority category and are sites of primary concern, based on their potential for waste migration off-site. They require further investigation in Phase II. Sites of secondary concern fall into Second Priority, with scores from 60 to 79. Further investigation for these sites is recommended. Third Priority sites (scores from 0 to 59) are other sites with the potential for contamination but with a low probability for migration off-site.

The following recommendations are made to further assess or prevent potential contaminant migration from waste disposal areas at Griffiss AFB.

Recommendations for Phase II

First Priority

1) Groundwater and surface water monitoring should be performed at Landfill No.1. There should be a minimum of one well up-gradient and two wells down-gradient. At a minimum, Interim Primary Drinking Water Standards, Priority Pollutants and TOC analyses should be carried out.

Second Priority

1) It is recommended that ground-water and surface water monitoring be performed on Landfills No. 2 and 7 as well, with similar analyses being carried out.

Other Recommendations

1) Initiate temporary remedial measures for landfill closure at Landfill No. 1 and No. 2. Improve cover at both sites (grade to eliminate ponding, provide plant cover) and construct leachate collection sump for surface runoff at Landfill No. 1.

2) Discontinue the use of dry wells for disposal of hazardous material.

3) Sample soil from Building 112's PCB dump area and analyse for PCB concentration.

4) Perform periodic analyses (Interim Primary Drinking Water Standards and Priority Pollutants and TOC) on water produced by on-base water wells.

APPENDICES

APPENDIX A

INSTALLATION HISTORY

AND ANNEX DESCRIPTIONS

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INSTALLATION HISTORY
AND ANNEX DESCRIPTIONS

INSTALLATION HISTORY

Griffiss Air Force Base was activated on February 1, 1942. Rome Air Depot, as it was originally named, had as its mission the storage, maintenance, and shipment of equipment for the Air Force Logistics Command. The base was renamed Griffiss Air Force Base in September, 1948 in honor of Lt. Col. Townsen E. Griffiss, a native New Yorker and Air Corps pilot who lost his life in an aircraft accident while stationed in England. In 1950, the base was transformed into an electronics center when the Watson Laboratory Complex of Red Bank, New Jersey was transferred to Griffiss. Also in 1950, the 49th Fighter Interceptor Squadron of the Aerospace Defense Command became a part of Griffiss.

In June, 1951 the Rome Air Development Center was established on Griffiss AFB. Its mission was to accomplish applied research, development, and testing of electronic air-ground systems. With an ever growing responsibility in the field of ground communications-electronics, the Rome Air Depot was redeisgnated the Rome Air Force Specialized Depot later in 1951. Then in November, 1958 it was redesignated Rome Air Material Area (ROAMA), making it the logistical manager for the Air Force Ground Communication Electronics Meteorological Support Program.

Headquarters Ground Electronics Engineering Installations Agency (GEEIA) was activated at Griffiss AFB in June, 1958 to engineer and install ground communications equipment throughout the world. In January 1959, the 4039th Strategic Wing of SAC was activated as a tenant on base and in February 1963, it was inactivated and the 416th Bombardment Wing was activated in its place assuming host responsibilities on July 1, 1970. Also in 1970, GEEIA merged with the Air Force Communications Service (AFCS) to form a single organization. Today, Continental Communications Division ((CCD), one of the two major regions of AFCS, is headquartered at Griffiss.

ANNEXES

Description

1. The Communications Receiver Site is located one mile northeast of Griffiss AFB and consists of 2.50 acres of fee owned land and 1.07 acres of easement for a total of 3.57 acres.
2. The Communications Transmitter Site is located 3.75 miles north of Griffiss AFB and consists of 9.63 acres of fee owned land.
3. The Ava Test Annex, consisting of 294.93 acres of fee owned land and two acres of easement, is located four miles east of Ava, New York.
4. Floyd Test Annex is located one mile southwest of Floyd, New York, and consists of 51.20 acres of fee owned land.
5. Forestport Test Annex consisting of 182.30 acres of leased land is six miles northeast of Forestport, New York.
6. Newport Test Annex No. 1 is located three miles southwest of Newport, New York on Tanner Hill and consists of 22.78 acres of fee owned land and 13.69 acres of easement.
7. Newport Test Annex No. 2, consisting of 1.93 acres of fee owned land, 1.16 acres of easement, and 3.52 acres of leased land is three miles southwest of Newport, New York on Irish Hill.
8. Quaker Hill is located five miles northwest of Westernville, New York and consists of 6.50 acres of leased land.
9. Stockbridge Test Site consisting of two acres of leased land is located two miles southeast of Ontario Center just outside of Rochester, New York.
10. Tummonds Hill Test Annex consists of two acres of leased land and is located in Wayne County, New York approximately 100 miles west of Griffiss AFB and two miles southeast of Ontario Center just outside Rochester, New York.
11. Vienna Test Annex consisting of 2.56 acres of leased land is located one mile northeast of Vienna, New York.

Mission

1.,2. Griffiss Communications Annexes provide VHF and UHF air-ground communications for air traffic control services including surveillance radar operations, precision radar approaches, and air traffic control tower functions.

3. The Ava Test Annex is a highly instrumented and versatile high frequency (HF) transmitter facility used for supporting HF research and development programs. It is part of an HF bi-static test-bed wherein frequency modulation/continuous wave detection data are collected and evaluated. The annex is equipped to transmit power up to 600 kilowatts peak with complex modulation capabilities.

4. The Floyd Test Annex provided facilities for support of RADC research, development and testing of high power, high resolution techniques, satellite identification techniques and high power coherent optical radar techniques. This Annex will be transferred to the Army.

5. The Forestport Test Annex has facilities for very low frequency (VLF) research and development experimentation purposes.

6.,7. The Newport Test Annexes provide versatile and accurate testing for the measurement of free space antenna characteristics. It is the RADC laboratory for investigation, development and advance of state-of-the-art antenna measurements.

8. The Quaker Hill Test Annex is a special facility for the testing and development of equipment and techniques utilized in positioning, calibrating and evaluating electronics systems.

9. The Stockbridge Test Annex provides facilities for support of RADC research and development programs in the area of reconnaissance, antenna pattern measurements, navigation, communications, and optics. It is the base station for the RADC microwave system.

10. The Tummonds Hill Test Annex is an integral part of the New York State Troposcatter link. The mission of this link is to provide a real world environment for experiments in Troposcatter communications.

11. The Vienna Test Annex provides a precisely established geodetic survey point (first order) for support of RADC research and development programs in QRC airborne electronic countermeasures, intelligence, electromagnetic deception, repeater development, tactical target delivery techniques and time of arrival measurements.

APPENDIX B

HAZARD EVALUATION METHODOLOGY

APPENDIX B

HAZARD EVALUATION METHODOLOGY

PRELIMINARY POTENTIAL CONTAMINATION ASSESSMENT

Various numerical methods for preliminary assessment of sites to determine the need of follow-up action have been developed. Under the auspices of EPA's Office of Enforcement, JRB Associates have devised a methodology for selecting sites for further investigation based on their potential for adverse environmental impact. ES has adopted a modified JRB technique for analysis of the Griffiss sites. The methodology relies primarily on available information but does provide some mechanisms for handling missing data so that sites can be preliminarily rated in most cases. This method has been accepted by EPA and is the method EPA investigators will use in determining the needs for remedial action and/or enforcement actions. A brief discussion of the rating factor system of analysis follows.

Site Rating Factor System

The following four basic assessment criteria categories are used in the evaluation:

- Receptors
- Pathways
- Waste Characteristics, and
- Waste Management Practices

These categories have been further broken down into 31 generally applicable rating factors as presented in Table B-1. For each of the factors, a four-level rating scale has been developed ranging from "0" (indicating no potential hazard) to "3" (indicating a high potential hazard). These rating scales are also presented in Table B-1. It should be pointed out that these scales have been devised so that rating factors can typically be evaluated on the basis of readily available information from published materials, public and private records, interviews with knowledgeable parties and site visits.

TABLE B.1

RATING FACTOR SYSTEM

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
		RECEPTORS		
Population Within 1,000 Feet	0	1 to 25	26 to 100	Greater than 100
Distance to Nearest Drinking Water Well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet
Distance to Reservation Boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet
Land Use/Zoning	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential
Critical Environments	Not a critical environment	Pristine natural areas	Wetlands, floodplains, and preserved areas; presence of economically important natural resources	Major habitat of an endangered or threatened species; presence of recharge area
Water Quality Designation of Nearest Surface Water Body	Agricultural or industrial use	Recreation, propagation and management of fish & wildlife	Shellfish propagation and harvesting	Potable water supplies

TABLE B.1

RATING FACTOR SYSTEM (cont'd)

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
		PATHWAYS		
Evidence of Water Contamination	No contamination	Indirect evidence	Positive proof from direct observation	Positive proof from laboratory analyses
Level of Water Contamination	No contamination	Low levels, trace levels, or levels less than maximum contaminant level (MCL) or EPA drinking water standards	Moderate levels or levels near MCL or EPA drinking water standards	High levels greater than MCL or EPA drinking water standards
Type of Contamination - Soil/ Biota	No contamination	Suspected contamination	Moderate contamination	Severe contamination
Distance to Nearest Surface Water	Greater than 1 mile	2,001 ft to 1 mile	501 ft. to 2,000 ft.	0 to 500 ft.
Depth to Groundwater	Greater than 500 ft.	51 to 500 ft.	11 to 50 ft.	0 to 10 ft.
Net Precipitation	Less than -10 in.	-10 to +5 in.	+5 to +20 in.	Greater than +20 in.
Soil Permeability	Greater than 50% clay ($<10^{-6}$ cm/s)	30% to 50% clay (10^{-4} to 10^{-6} cm/s)	15% to 30% clay (10^{-2} to 10^{-4} cm/s)	0 to 15% clay ($>10^{-2}$ cm/s)
Bedrock Permeability	Impermeable ($<10^{-6}$ cm/s)	Relatively impermeable (10^{-4} to 10^{-6} cm/s)	Relatively permeable (10^{-2} to 10^{-4} cm/s)	Very permeable ($>10^{-2}$ cm/s)
Depth to Bedrock	Greater than 60 ft.	31 to 60 ft.	11 to 30 ft.	0 to 10 ft.
Surface Erosion	None	Slight	Moderate	Severe

TABLE B.1

RATING FACTOR SYSTEM (cont'd)

WASTE CHARACTERISTICS

Judgemental hazardous rating from 30 to 100 points based on the following guidelines:

Points	Condition
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantities of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

TABLE B.1

RATING FACTOR SYSTEM (con'd)

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
	WASTE MANAGEMENT PRACTICES			
Record Accuracy and Ease of Access to Site	Accurate records, no unauthorized dumping	Accurate records, no barriers	Incomplete records, no barriers	No records, no barriers
Hazardous Waste Quantity	<1 ton	1 to 5 tons	5 to 20 tons	>20 tons
Total Waste Quantity	0 to 10 acre ft.	11 to 100 acre ft.	101 to 250 acre ft.	Greater than 250 acre ft.
Waste Incompatibility	No incompatible wastes are present	Present, but does not pose a hazard	Present and may pose a future hazard	Present and posing an immediate hazard
Absence of Liners or Confining Strata	Liner and confining strata	Liner or confining strata	Low quality liner or low permeability strata	No liner, no confining strata
Use of Leachate Collection Systems	Adequate collection and treatment	Inadequate collection or treatment	Inadequate collection and treatment	No collection or treatment
Use of Gas Collection Systems	Adequate collection and treatment	Collection and controlled flaring	Venting or inadequate treatment	No collection or treatment
Site Closure	Impermeable cover	Low permeability cover	Permeable cover	Abandoned site, no cover
Subsurface Flows	Bottom of landfill greater than 5 ft. above high groundwater level	Bottom of landfill occasionally submerged	Bottom of fill frequently submerged	Bottom of fill located below mean groundwater level

Since the rating factors do not all assess the same magnitude of potential environmental impact, a numerical multiplier has been assigned to each factor. These multipliers were developed to indicate the relative magnitude of impact of that factor. In addition, weighing factors have been assigned to the Factor Subscores to arrive at a properly balanced Overall Score.

The following five hazard potential scores are the result of a site rating:

- Overall Score
- Receptors Subscore
- Pathways Subscore
- Waste Characteristics Subscore, and
- Waste Management Subscore.

APPENDIX C

BIOLOGICAL RESOURCES BASELINE ENVIRONMENT

APPENDIX C

BIOLOGICAL RESOURCES BASELINE ENVIRONMENT

The biological resources characteristic of Griffiss AFB have been identified and studied in previous environmental studies, particularly the TAB A-1 Environmental Narrative for the base, the Forest Management Plan, and the Fish and Wildlife Management Plan.

FLORA

Griffiss Air Force Base consists of approximately 935 acres of intensively managed improved grounds,of which, 635 acres are comprised of lawns, landscape plantings or turfed athletic fields. The remaining lands, approximately 2,985 acres, is unimproved grounds. Forest areas managed by the Forest Management Plan consist of approximately 740 acres.

Aquatic Plants

The typical tracheophytes such as cattails, burseeds, pondweed, naiads, water plantains, wild cerery, and water lillies that are found in most ponds and streams are absent in the base ponds. However, there are horsetails and a few of the various ferns throughout the meadow, and duckweed is scattered sparsely along the waters' edge. The green and blue-green algaes, along with a few of the other major groups of the Phytoplankton, make up the remaining species of the aquatic flora found on base.

Agricultural Crops

There are no commercially cultivated field or truck crops grown within the boundaries of the AFB. No pasture or forage crops are grown and domestic stock grazing is not permitted on the base.

Forest Management

The native vegetative cover on the wooded portion of the base is primarily an upland hardwood forest with a few species of conifers present. The most common species are: white pine, beech, birch, red and sugar maple, with some black cherry and basswood. This mature forest land accounts for approximately 350 acres of the 780 acres managed on a

multiple-use basis by the Forest Management Plan, the Outdoor Recreation Plan, the Landscape Development Plan and the Fish and Wildlife Management Plan. In addition to this existing woodland habitat, approximately 350 acres of previously maintained lawn and grassland areas have been planted with a variety of conifer seedlings in a continuous effort to reforest unused or poorly used land resources on base.

The majority of the forest stands on Griffiss AFB which are included within the scope of the current Forest Management Plan are young, vigorously growing trees, generally free from any major insect or disease problems. All of the management sites are either flat or gently sloping and there are no adverse slopes. About equal areas are in hardwood species, principally gray birch, aspen, maple and black cherry and in evergreen species, planted red, scotch and white pines, larch and white and Norway spruce and natural stands of Hemlock. Six of the management areas are open fields suitable for reforestation. Two areas are used for recreation purposes and several additional areas are under miscellaneous non-forest use. Some plants, which occur on the New York State Department of Environmental Conservation list of threatened and endangered species, are present in quantity on various management sections. The 740.6 acres under the plan can be classified as follows:

Commercial Forest Land (674.8 Acres)

Commercial forest land which is capable of producing crops of industrial wood in excess of 20 cu. ft. per acre annually under management and which is not programmed for other non-compatible uses. It includes both non-stocked (suitable for reforesting) and inoperable areas provided they are potentially stockable and operable. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet wide to qualify as commercial forest land. The minimum incremental area is two acres.

Commercial forest land, regeneration (106 acres): Timber or fiber production is sub-marginal or non-existent on which treatment is to harvest the remaining merchantable products and regenerate the stand. This category includes open land scheduled for regeneration or commercial timber crops.

Commercial forest land, no cut (286.2 acres): These areas are producing satisfactorily and do not require a timber cut during the next five (5) years.

Commercial forest land, intermediate cut (33 acres): Stocked areas on which an intermediate cut is required within the next five years to continue optimum timber and fiber production.

Commercial forest land, modified (249.6 acres): Cutting practices will be modified. Includes small stands within the cantonment area, buffer zones around developed recreational sites, and aesthetic area along major roads and adjacent to lakes and streams, generally a distance of 100 ft. to 300 ft. wide.

Non-commercial Forest Land (65.8 Acres)

Unregulated (commercial (56.8 acres): Forest land which will not sustain timber harvests due to location or unique circumstances. This includes target areas, gunnery ranges, certain watershed protection, forests on extremely steep slopes, and unique areas set aside for botanical, historical, or special study purposes.

Non-Commercial (9 acres): Forest land which is incapable of producing crops of industrial wood (less than 20 cu. ft. per acre annual production) because of adverse site conditions.

Two areas of special interest are as follows:

Forest Area #35 - A unique botanical area that contains a number of plant species which are listed as threatened or endangered plant species by the New York State Environmental Conservation Law, Sections 1425-2 and 9-1503.

Fam Camp Area - An area that is listed as a most unique botanical area of original mature hardwood stand of the Mohawk River Valley Flood Plain by the Oneida County - Herkimer County Comprehensive Land Plan.

Threatened and Endangered Species (Plants)

The following wild plants are protected in New York State, pursuant to Section 193.3 of the N.Y.S. Environmental Conservation Law 9-1503, and have been found growing in a natural state on Griffiss AFB.

Pink Lady's Slipper	Cypripedium acaule
Orchid var.	Orchis spp.
Ferns var.	Filicinae spp.
Ophioglossales var.	Ophioglossales spp.
Adder's Tongue	Erythronium Amaricanum
Burning Bush	Euonymus spp.
Lily var.	Lilium spp.
Clubmoss	Lycopodium spp.
Princess Pine	"
Ground Pine	"
Heath Cypress	"
Trillium var.	Trillium spp.
Ginseng	Panax quinquefolius
American Bittersweet	Celastrus, scandens
Flowering Dogwood	Cornus florida
Dutchman's Breeches	Dicentra cucullaria
Jack-in-the-Pulpit	Arisaema hiphyllun
Wintergreen	Gaultheria procumbens
Partridge Berry	Mitchells repens
Bloodroot	Sanguinaria spp.

None of the plant species considered threatened or endangered by the U.S. Department of Interior (50CFR Part 17) have been identified as native to Griffiss AFB.

Obviously the habitat suitable for the proliferation of the various species of endangered plants is as varied as the plant species themselves. In general, the plants listed above have been found to grow in a natural state in those wooded portions of Griffiss AFB which have not been significantly disturbed over the years of base construction and development. In approximate figures, Griffiss contains 350 acres of native woodlands. An additional 350-400 acres on base is currently in the pioneer successional levels of evolution to the mixed hardwood-conifer forest prevalent on the remainder of the base forests and it is assumed that as more mature levels of succession are achieved, the habitat for these endangered plants shall increase.

Two areas on base, having a total of approximately 45 acres, have been declared in several Natural Resources Management Plans as unique

botanical zones. These two areas contain particularly large concentrations of endangered wild plants. Consequently, the areas have been excluded from any developmental activities which would alter the environment and destroy the unique growing situation.

The first of these two unique botanical areas is a climax forest stand of mixed eastern hardwoods which borders the Mohawk River on the western perimeter of the base. The area contains perhaps 25 acres of mainly flood plains and was never developed when the base was constructed. The forest is listed as a most unique botanical area of original mature hardwood stand of the Mohawk River Valley Flood Plains by the Oneida County - Herkimer County Comprehensive Land Plan. Here are found four species of Trillium, the species in the generas Filicina and Ophioglossales, bloodroot, flowering dogwood, Dutchman's breeches, adder's tongue, wintergreen and partridge berry, among others.

The second unique botanical zone is in a sandy depression between the Operations Area and the Military Family Housing Area. The flora is particularly unique, and about a dozen plant species which are listed as threatened or endangered plant species by the New York State Environmental Conservation Law are found growing here in a natural state. The area is particularly favorable for Lycopodium and four species are growing in profusion, as are giant Trillium, painted Trillium and the elusive Jack-in-the-Pulpit, among others.

FAUNA

Initial wildlife inventories were conducted at Griffiss AFB as a part of the Fish and Wildlife Plan of 1968. Field studies undertaken at that time by wildlife biologists from the U.S. Department of Interior Fish and Wildlife Service and the State of New York Department of Environmental Conservation and a subsequent inventory conducted in 1974 by the base's wildlife biologist shows a limited, though balanced ecosystem on base. Terrestrial species variety is excellent and populations are well within the carrying capacity of the existing habitat.

Aquatic inventories also show balanced ecosystems, though limited also. Two aquatic macrozones exist within base perimeter; both of these are warm water hydroseres. Species diversity is excellent, though restricted in numbers due to the small size of the water bodies.

Large Animals

Domestic animals have not been allowed on Griffiss and there are no plans to introduce them at this time, although Griffiss is located in the middle of the dairy industry in New York State. The white-tailed deer is the only wild animal known in the area over thirty pounds.

Small Mammals

The grey squirrel is common as is the cottontail rabbit, the muskrat, raccoon and striped skunk. Some other mammals that have been noted on the installation include the mink, red fox, gray fox, and woodchuck.

Predatory, Game and Song Birds

No hawks have been found to inhabit the Griffiss Air Force Base proper. Four game birds observed on base include the woodcock, pheasant, ruffed grouse, and dabbling duck. Song birds are the most diverse and abundant, especially the perching birds. These include orioles and red-wing blackbirds, killdeer, doves and pigeons, woodpeckers, owls, wrens, robins, thrushes, and bluebirds to name a few. Griffiss has established various shelters around the base for these birds.

Fish

The outlet from Mohawk Pond which flows through the west end of the base near the golf course empties into the Mohawk River through a flow control device. This stream is mainly a slow moving, muddy body of water that is not presently conducive to proliferate fish and aquatic fauna. Its bottom is composed of mud and decaying organic matter with its deepest point about three feet deep. It harbors diverse zooplankton and its production is seasonally dependent. This pond is now known as the Mohawk Pond and is stocked with various sunfish and catfish.

The Base Pond is located on the east side of the base adjacent to Perimeter Road. It is about one acre in size and has a maximum depth of five feet. It is fed continuously from a marsh that originates off base. This pond is a cool water reservoir that houses warm water fish (sunfish and catfish) for an annual program. Water temperatures in summer rise to $70^{\circ}F$ and seldom go over $80^{\circ}F$. There is no problem with the dissolved oxygen level as tests have shown it to be consistently high and very suitable for aquatic life. Monthly water samples show the pH

to be consistently within the range of 6.5 to 9.0 which is satisfactory for growth and reproduction of fish. The pond is very turbid during the warmer months with silt and alluvial deposits from the marsh.

Fish stocking at GAFB is limited to the Mohawk Pond on a put-and-take basis by military youths, and is limited to species of sunfish and perch.

Threatened and Endangered Species (Animals)

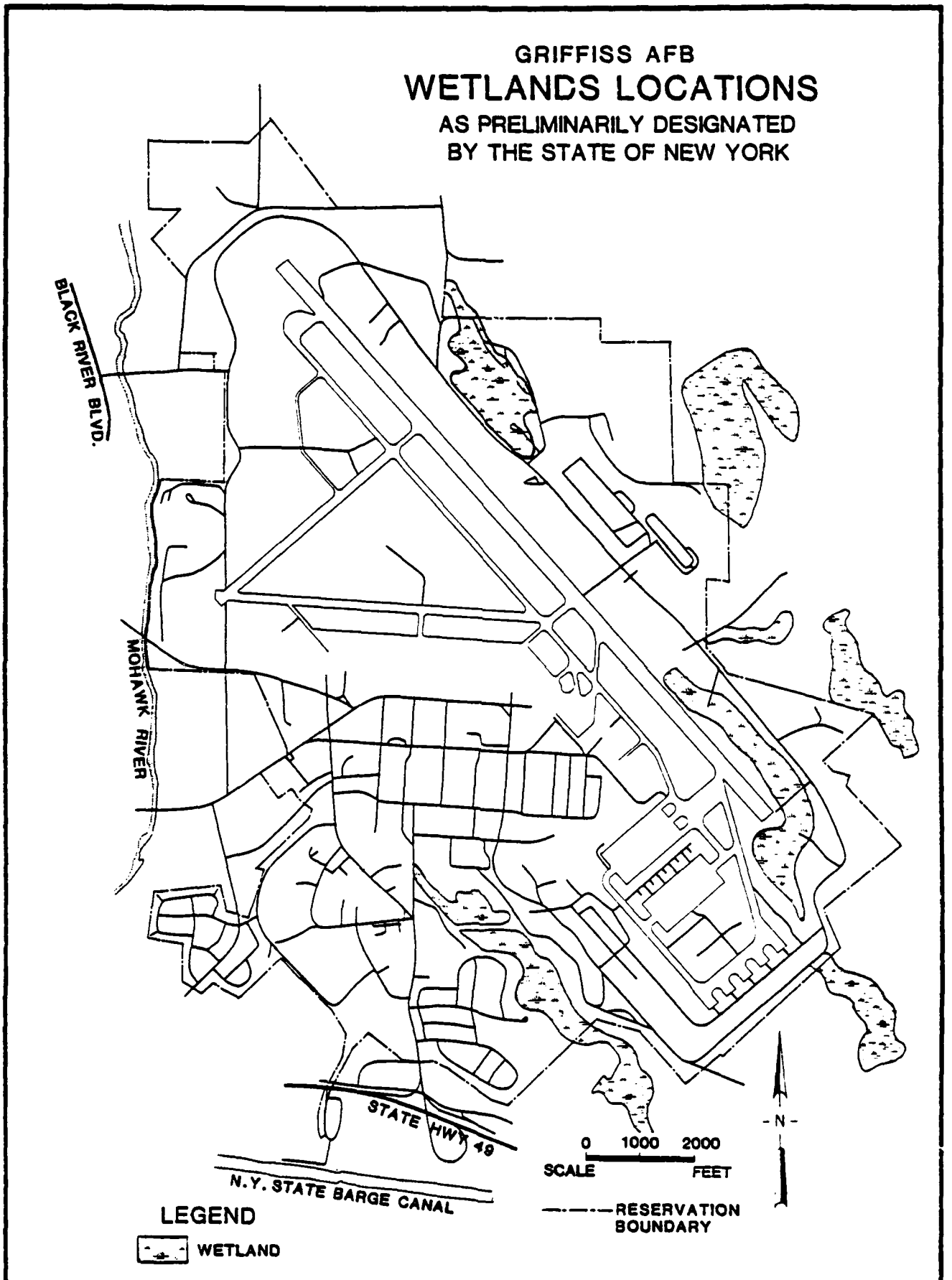
The following animals and birds are on the endangered and threatened listing. The following species occur on or within a fifty mile radius of Griffiss and were not inventoried around the thirty RADC off base sites.

- The bog turtle, may occur on Griffiss proper in ponds, marshes and wet areas and could be adversely affected by draining or filling such areas.
- The southern bald eagle drifts north into the area during June, July, August and September. Although it is a possible immigrant through the area, no known nests have been observed within 50 miles of Rome.
- The peregrine falcon is another endangered species that drifts over the area. A few pass over the base during spring and fall migration.
- The Indiana bat is rare and occurs in the area in extremely small numbers from May to October. The exact status is unknown. This species feeds at night on insects attracted to runway lights and could be ingested by jet aircraft.
- The ipswich sparrow is a possible transient during the winter months. Few inland sightings have been reported.
- The eastern cougar and the eastern timber wolf have both been extirpated. Both of the species formerly occurred throughout the area.

Wetland Areas

Several wetland areas have been identified on Griffiss using a preliminary survey conducted by the New York Department of Environmental Conservation (DEC). These "preliminary" designated wetlands are shown in Figure C.1. Wetland areas are regulated by the New York DEC.

FIGURE C.1



SOURCE: GRIFFISS AFB COMPREHENSIVE PLAN DOCUMENTS, SEPT. 1980

APPENDIX D

FACILITY DESCRIPTIONS

APPENDIX D

FACILITY DESCRIPTIONS

INDUSTRIAL OPERATIONS (SHOPS)

Machine (Fab) Shop, Building 3. Mechanical requirements are translated into mechanical devices and small experimental models in this shop.

Battery Shop, Building 101. Personnel from this shop are responsible for the proper maintenance of most batteries and battery packs on base.

Engine Shop, Building 101. Personnel are responsible for maintenance, servicing, and repairing the J-75 jet engine of F-106 aircraft. The shop receives engines from the 49th FIS Engine Shop, Building 100.

Environmental Systems Shop, Building 101. This shop is concerned with the performance and service of aircraft environmental systems.

Hydrostatics Shop, Building 101. Personnel from this shop are responsible for the proper maintenance of the base's portable fire extinguishers.

Plastic Shop, Building 101. This shop conducts fiberglassing and repair of aircraft parts and special projects for RADC. The operations include bonding fiberglass, hand lay-up of fiberglass, spray lay-up of fiberglass, cutting and sanding. Sheets of acrylic are cut, glued and sanded to repair or make parts.

Plating Shop, Building 101. Personnel are responsible for cleaning, plating, sand blasting, buffing and polishing metal items for fabrication. Plated materials include cadmium, nickel, copper, silver, gold and brass.

Pneudraulic Shop, Building 101. Personnel work and perform duties on various aircraft hydraulic systems, performing maintenance and repair, testing of systems on the flight line and repairing and relining of the brakes of various aircraft.

Propulsion Shop, Building 101. This shop provides inspection, assembly and disassembly of jet engines, subassemblies and components,

removing and installing engine quick-change kits (accessories to adapt engines to particular aircraft).

Wheel and Tire Shop, Bearing Room, Building 101. Personnel are responsible for removing wheels and tires from aircraft (SAC only), cleaning bearings and wheels, and rebuilding the assemblies. The wheels and bearings are cleaned with PD-680 both in the shop and in the bearing room. Final degreasing in an isopropyl tank.

Central Steam Plant, Building 117. Personnel maintain and operate the plant nine months out of the year, maintaining and changing pumps and auxiliary equipment, and repacking approximately 500 valves per year. Grinding and some arc welding are performed along with the cleaning of steam traps (about 100 per year).

Survival Equipment Shop, Building 212. Operations at this shop include cleaning, repairing, inspecting and maintaining survival equipment such as parkas, parachutes, flight suits, flotation equipment, and aircraft thermal curtains. Twenty percent of the shop's work is done outside of the shop area on the flightline.

Tanker Repair, Buildings 214, 215, 216. Major and minor repairs on fuel tankers and deicers are made here. Repairs and maintenance on the vehicles include overhauling engines, pumps, meters, hose reels, bottom loadings, valves, water separators, filter assemblies, and repairing inside problems on tanker vehicles. This shop supports Fort Drum by conducting all vehicle repairs and maintenance, and assists Niagara Falls Air Force Station and Hancock Field in emergencies.

Vehicle Maintenance Branch, Building 255. This shop is charged with the repair of radiators and tanks of all vehicles used on base. A small glass repair facility is also located within the general shop area.

Heating Shop, Building 301. This shop services the various heating units around the base. One aspect of its mission is to replace old asbestos pipe insulation with substitute material.

Carpenter Shop, Building 334. All carpentry work for the base including building and housing maintenance is performed by shop personnel. Over 65 percent of all the work is performed outside the shop.

Demineralizer, Building 778. This unit consists of a typical ion-exchange demineralizer and an underground 25,000 gallon storage tank. NaOH and H_2SO_4 are used to recharge resin.

Aerospace Ground Equipment Shop, Building 786. This shop is responsible for Aerospace Ground Equipment ranging from MD-3, MA1A, MC1A units to the M-1 heater units. Personnel are responsible for the repair and maintenance of this equipment.

Short Range Attack Missile (SRAM) Facility, Building 829. This facility houses all aspects of repair and maintenance of the SRAM (AGM 69A) missile. Separate sections of the facility include missile systems checkout, munitions, verification and checkout equipment (VACE), and supervision.

Engine Test Cell, Building 796. Operational checks of various parts and lines on jet engines after in-shop maintenance are performed here.

RESEARCH AND DEVELOPMENT LABS

Acid Etching, Room 98, Building 3. This area is used for producing printed circuit boards. The process consists of photodelination from negatives onto presensitized blank boards.

Lab, Room 91, Building 3. This lab is responsible for coating, etching and photo resisting integrated circuits. Various materials are analyzed for moisture content, and melting points. Devitrofication procedures are carried out here.

Lab, Room 64A and B, Building 3. Chemical processing, cleaning, and storage of integrated circuits is accomplished in Room 64A, Wet Room. Standard acids and bases are utilized in the hoods where a small polisher and grinder is located. A vapor degreaser which uses Freon II is also located here but not presently in use. Photography is done in Room 64B with the Scanning Electron Microscope (SEM). The sputtering unit is used for depositing a thin layer of gold on the microcircuits. An electric current (1000v) is passed through argon gas and the gold atoms are deposited on the microcircuit. A vacuum sealer is used for sealing the microcircuits.

Base Photo Lab, Building 14. This lab is responsible for black and white, color transparency, and portrait photogaphy in support of base activities and aerial photography as required.

NDI Lab, Building 101. The Non-Destructive Investigations Lab is

responsible for cleaning and inspecting aircraft parts and components for integrity. Annual inspections are performed on all hoists and slings and associated AGE equipment.

RADC, Building 106. Signal processing techniques are carried out and new techniques are tested on computers here. The etching of micro-circuits is carried out in the etching room under a ventilation hood.

High Power Lab, Building 112. High power electrical research and testing is carried out in this lab. A number of rooms, including a copper metal shielded room, make up this lab facility. PCB oil leaks out of a roof transformer and there are reports that some PCB oil was poured on the ground in front of the building for disposal.

Supply Fuels Laboratory, Building 223. This lab is responsible for collecting and analyzing fuel samples during various stages of usage and storage on base. Fuels are analyzed for water concentration, de-icing, and for rust and corrosives contamination.

Hospital & Dental X-Ray Lab, Building 510. Exposed x-ray film for medical purposes is developed in this lab.

Hospital Clinical Lab, Building 510. All clinical and analytical work done for medical purposes is carried out in this lab.

Floyd Test Site. This annex is a former Research and Development facility operated by RADC and located approximately four miles southeast of GAFB. An oil spill occurred at this site on 15 April 1981, as a result of an attempted theft of copper pipe connected to a storage tank containing 5,000 gallons of oil with 60 ppm PCB. By the time the spill was stopped, 3,600 gallons had spilled into the diked area. Approximately 1,000 gallons were pumped back into the tank, indicating that 2,600 gallons had been absorbed into the clay soil at the diked area. This soil was excavated to a depth of approximately two feet and placed in 100 55-gallon drums for disposal by a licensed contractor. The oil remaining in the tank was transported via tank truck to Building 112 for storage and use. The solvent from tank truck rinsing has been stored at Lot 69, the hazardous waste storage area.

PESTICIDE AND HERBICIDE UTILIZATION

Entomology Shop, Building 301. Personnel ensure that effective and

corrective pest control measures are established and accomplished at all installations. Training personnel and providing qualified technical entomological supervision are also functions of this shop. In conjunction with the base Civil Engineer the entomology service investigates the occurrence, abundance and economic factors relating to pests which damage or destroy property.

Grounds Maintenance Unit, T-9. This unit is responsible for maintenance of all outside areas of GAFB including herbicide application, grass cutting, snow plowing, tree work and golf course maintenance. Large area application of herbicides is accomplished with two tractor drawn sprayers. Application around poles, fire hydrants, buildings and some fences is accomplished by hand, using dry dusters.

Grounds Maintenance Unit, Golf Course. This unit is responsible for maintenance of the golf course including herbicide application, grass cutting and tree work.

Forestport Site. This annex plays a significant role in greatly improving state-of-the-art very low frequency communication technology.

General Chlordane Usage. Chlordane was used at GAFB until early 1980 primarily for ant control, with only rare and occasional use for other insect or rodent control. Application consisted of spraying a 0.5% solution of Chlordane around the interior and exterior baseboards of buildings. No ground drilling was carried out at any time to place the compound. The average usage of Chlordane was 10-15 lbs. (dry) per month.

FUELS MANAGEMENT

Jet Aircraft Fuel, JP-4, may be brought on base by any of four means: river barge, pipeline, tank truck, or rail tank car. At the present time the majority of this fuel arrives via the commercial pipeline operated by Buckeye Pipeline company of Verona, New York. The remainder of the JP-4 is brought in by barge a few times each year. In both cases, the point of entry to the POL facilities is at the fuel storage site located near the New York State Barge Canal, south of the main base. Although JP-4 does not currently arrive by truck or rail, unloading facilities for both are available at tank farm number three

(Otis Street and Brooks Road, on base), and trucks may be unloaded at the barge canal site.

The receipt of JP-4 by barge presents several problems with respect to fuels handling and spill prevention. Currently, a floating boom is rented from a neighboring facility (Sears Oil Company) for the containment and cleanup of fuel spilled during the unloading process. The potential for such spills is largely not under the control of the Air Force, since the barges, pumps, hoses, and connections are maintained and operated by the outside contractors who own the barges. Further, the pipeline from the unloading dock to the bulk storage facility is subject to frequent vandalism and cannot be maintained in proper operating condition on a regular basis. Cleanup of fuel spilled during barge unloading consists of containing the spill with the floating boom until sorbent materials can be applied. With minor spills, the JP-4 generally evaporates quickly and sorbant material is not used.

Bulk storage of JP-4 is located at the POL facility near the barge canal and consists of three floating-cover tanks with a capacity of 15,000 bbl (630,000 gallons) each. These tanks are individually diked with gravel and the diked volume appears to be one to two times the volume in the tank. Rainwater leaves the diked area after passing through a fuel/water separator with the water discharge going to the barge canal. Rainwater can also percolate through the gravel dikes (which apparently does not contain a solid core) or can be discharged through a drain controlled by a locked valve.

Trucks are loaded or unloaded at the barge canal site to service small volume needs of aircraft, 3000-5000 gallons. The truck loading/unloading area is paved and the runoff is collected and passed through a fuel/water separator. A fuel spill collection tank is associated with the separator; water is passed to the barge canal.

From the bulk storage area, JP-4 is piped to one of several storage areas on the main base. The pipeline is buried for all but about 100 yards where it passes over Three Mile Creek. The storage for JP-4 on the main base is located in two areas: Tank Farm No. 3 and on SAC hill. The facility at Tank Farm No. 3 consists of four 25,000 gallon tanks below ground. This facility is used to fill trucks for servicing aircraft on the flightline. The fuel hydrant system associated with this

tank farm has been disconnected and is now inactive. POL facilities on SAC hill serve the fuel hydrant system for fueling larger aircraft. There are five pumphouses associated with the hydrant system and each is supplied by 4-50,000 gallon storage tanks and 1-2000 gallon collection tank. There is also a 1000 gallon JP-4 tank just southeast of Building 786 in the SAC area, although its purpose is not known. All of these tanks are below ground.

Before fueling or filling trucks, the JP-4 must be passed through a filter bowser to remove suspended particles and water. The filter material must be changed periodically, and these are allowed to dry, placed in bags, and disposed of with regular nonhazardous trash, since no flammable JP-4 remains after drying.

No. 2 Heating Oil is brought on base by truck (rail car unloading connections have been capped off) just east of Building 14 at the Oil Storage and Dispensing Station. Of the five 12,000 underground tanks at this site, three are used for FS-2 storage. Heating oil is pumped to trucks for distribution on the base. Other bulk storage locations for No. 2 heating oil include a 30,000 gallon tank southwest of Building 510, the base hospital, and a 10,000 gallon tank north of Building 724, the officers' club. Other smaller storage tanks are located throughout the base and they are detailed in the Spill Prevention, Control and Countermeasures Plan.

No. 6 Fuel Oil arrives on base by rail tank car and is unloaded just south of Building 117, the heating plant, where it is principally used. From there it is pumped to three bulk storage tanks in Farm No 3. Two of these above-ground tanks hold 10,000 bbl (420,000 gallons) and the third holds 20,000 bbl (840,000 gallons). The tanks are individually diked with an asphalt-type material and the diked volume appears to be sufficient to contain between one and two times the tank volume. On one occasion in recent years, overfilling of a bulk storage tank resulted in the filling of the diked area. No. 6 fuel oil is pumped from bulk storage back to two 25,000 gallon day tanks at the heating plant (Building 117) where it is used.

Automotive Gasoline (MOGAS) is brought on base by truck and is stored in several sites. Bulk storage of MOGAS is in two 25,000 gallon underground tanks in Farm No. 1. These are filled and emptied by a

water displacement system, with the excess water being passed through a separator before discharge to the sewer. A 15,000 gallon tank is at the base service station (Building 261), and 4-10,000 gallon tanks are at the BX service station. These are all underground. There is also a 6000 gallon tank underground west of Building 126, and two 1000 gallon tanks in the SAC area (southeast corner of Building 793 and southeasterly of Building 786).

Diesel Fuel is brought on base by truck and is stored in two locations: a 5000 gallon tank west of Building 220, and in one of the 12,000 gallon tanks in the oil Storage and Dispensing Station (three others here are used for No. 2 heating fuel as mentioned above and the fifth is inactive) both of which are below ground.

Aviation Gasoline (AVGAS) was brought on base by truck and stored in a 2000 gallon underground tank at the Aero Club east of Building 220 on Apron #4. AVGAS is apparently not used in any military planes or jets. Bulk storage facilities for AVGAS have been deactivated.

Other Petroleum Products used on base include: propanol, which is stored below ground in a 19,000 gallon tank northwest of Building 131; kerosene, which is stored below ground in a 12,000 gallon tank south of Building 301; and de-icing fluid (isopropyl) which is stored in two 50,000 gallon tanks in Farm No. 1 and a 2,600 gallon tank northwest of Building 782 in the SAC area.

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

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Base Documents Reviewed

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Base Bioenvironmental Engineer's Industrial Shop Files
Base Comprehensive Plan Documents, September, 1980
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Base Sanitary Sewerage System Plan
Base Storm Sewerage System Plan

Approximate Number of Personnel Interviewed: 61

APPENDIX F

HAZARD ASSESSMENT RATING METHODOLOGY

GRIFFISS AIR FORCE BASE

USAF INSTALLATION RESTORATION PROGRAM
HAZARD ASSESSMENT RATING METHODOLOGY

BACKGROUND

The Department of Defense (DOD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DOD facilities. One of the actions required under this program is to:

> "develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts." (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

The first site rating model was developed in June 1981 at a meeting with representatives from USAF Occupational Environmental Health Laboratory (OEHL), Air Force Engineering Services Center (AFESC), Engineering-Science (ES) and CH_2M Hill. The basis for this model was a system developed for EPA by JRB Associates of McLean, Virginia. The JRB model was modified to meet Air Force needs.

After using this model for 6 months at over 20 Air Force installations, certain inadequacies became apparent. Therefore, on January 26 and 27, 1982, representatives of USAF OEHL, AFESC, various major commands, Engineering Science, and CH_2M Hill met to address the inadequacies. The result of the meeting was a new site rating model designed to present a better picture of the hazards posed by sites at Air Force installations. The new rating model described in this presentation is referred to as the Hazard Assessment Rating Methodology.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned and for direct evidence 100 points are assigned. If no evidence is found, the highest score among three possible routes is used. These routes are surface water migration, flooding, and ground-water migration. Evaluation of each route involves factors associated with the particular migration route. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The scores for each of the three categories are then added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Sites at which there is no containment are not reduced in score. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factor to the sum of the scores for the other three categories.

FIGURE 2

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE _____

LOCATION _____

DATE OF OPERATION OR OCCURRENCE _____

OWNER/OPERATOR _____

COMMENTS/DESCRIPTION _____

SITE RATED BY _____

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to reservation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	_____	_____

Receptors subscore (100 X factor score subtotal/maximum score subtotal) _____

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) _____
2. Confidence level (C = confirmed, S = suspected) _____
3. Hazard rating (H = high, M = medium, L = low) _____

Factor Subscore A (from 20 to 100 based on factor score matrix) _____

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

_____ X _____ = _____

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

_____ X _____ = _____

TABLE 1

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1 - 25	26 - 100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1 mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential	6
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	3
E. Critical environments (within 1 mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination.	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands.	10
F. Water quality/use designation of nearest surface water body	Agricultural or industrial use.	Recreation, propagation and management of fish and wildlife.	Shellfish propagation and harvesting.	Potable water supplies	6
G. Ground-Water use of uppermost aquifer	Not used, other sources readily available.	Commercial, industrial, or irrigation, very limited other water sources.	Drinking water, municipal water available.	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available.	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1 - 50	51 - 1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1 - 50	51 - 1,000	Greater than 1, 000	6

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

II. WASTE CHARACTERISTICS (Continued)

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
50	L	S	M
	L	C	L
	M	S	H
	S	C	M
40	S	S	H
	M	S	M
	M	C	L
	L	S	L
30	S	C	L
	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:
Confidence Level
- o Confirmed confidence levels (C) can be added
- o Suspected confidence levels (S) can be added
- o Confirmed confidence levels cannot be added with suspected confidence levels

Waste Hazard Rating
- o Wastes with the same hazard rating can be added
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. WASTE MANAGEMENT PRACTICES FACTOR

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Fire Proection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1 or III-B-3, then leave blank for calculation of factor score and maximum possible score.

APPENDIX G

HAZARD ASSESSMENT RATING METHODOLOGY FORMS

GRIFFISS AIR FORCE BASE

HAZARD ASSESSMENT RATING METHODOLOGY SCORES

GRIFFISS AIR FORCE BASE

	Site	HARM Score	Page Number
1)	Landfill No. 1	72	G-1
2)	Landfill No. 2	55	G-3
3)	Landfill No. 7	53	G-5
4)	Bulk Fuel Storage	51	G-7
5)	Landfill No. 6	50	G-9
6)	General Chlordane Application	50	G-11
7)	Drywell Entomology Shop, Building 301	48	G-13
8)	Yellow Submarine Holding Tank	48	G-15
9)	Hazardous Waste Liquid Storage Area	47	G-17
10)	Drywell, Bldg. 3,	47	G-19
11)	Former Entomology Storage Shed	46	G-21
12)	High Power Lab	45	G-23
13)	Landfill No. 5	44	G-25
14)	Drywell, Central Steam Plant, Bldg. 17	43	G-27
15)	Transportation Vehicle Maintenance Drywells	43	G-29
16)	PCB Spill Area	40	G-31
17)	Drywell, Power Plant, Bldg. 219	36	G-33
18)	PCB Rooftop Transformer	34	G-35
19)	Waste Oil Storage Area	31	G-37

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	3	8	24	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
		Subtotals	76	108

Subscore (100 X factor score subtotal/maximum score subtotal) 70

2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	3	8	24	24
Subsurface flows	1	8	8	24
Direct access to ground water	2	8	16	24
		Subtotals	84	114

Subscore (100 x factor score subtotal/maximum score subtotal) 74

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 80

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	63
Waste Characteristics	72
Pathways	80
Total 215 divided by 3 =	72
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

72 X 1.0 = 72

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	3	8	24	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	66	108
		Subscore (100 X factor score subtotal/maximum score subtotal)		61

2. Flooding	0	1	0	3
		Subscore (100 x factor score/3)		0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
		Subtotals	52	114
		Subscore (100 x factor score subtotal/maximum score subtotal)		46

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 61

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	60
Waste Characteristics	45
Pathways	61

Total 166 divided by 3 = 55
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

55 x 1.0 = 55

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	2	8	16	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 54

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
		Subtotals	60	114

Subscore (100 x factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 54

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	60
Waste Characteristics	45
Pathways	54

Total 159 divided by 3 = 53 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

53 x 1.0 = 53

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	18
		Subtotals	58	102

Subscore (100 X factor score subtotal/maximum score subtotal) 57

2. Flooding

	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability No cover	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	60	114

Subscore (100 x factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 57

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	57
Waste Characteristics	40
Pathways	57
Total 154 divided by 3 =	51
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

51 x 1.0 = **51**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	2	8	16	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	74	108

Subscore (100 X factor score subtotal/maximum score subtotal) 69

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	14
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	44	114

Subscore (100 x factor score subtotal/maximum score subtotal) 39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 69

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	44
Waste Characteristics	36
Pathways	69

Total 149 divided by 3 = 50

Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

50 x 1.0 = 50

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	50	108

Subscore (100 X factor score subtotal/maximum score subtotal) 46

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	44	114

Subscore (100 x factor score subtotal/maximum score subtotal) 39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 46

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	43
Waste Characteristics	60
Pathways	46
Total 149 divided by 3 =	50
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

50 x 1.0 = **50**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108

Subscore (100 X factor score subtotal/maximum score subtotal) 39

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation Water added	3	6	18	18
Soil permeability	2	8	16	24
Subsurface flows	-	8	-	-
Direct access to ground water	0	8	0	24
		Subtotals	50	90

Subscore (100 x factor score subtotal/maximum score subtotal) 52

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 52

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	29
Waste Characteristics	64
Pathways	52

Total 145 divided by 3 = 48 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

48 x 1.0 = 48

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	-	8	-	-
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	16
		Subtotals	42	76

Subscore (100 X factor score subtotal/maximum score subtotal) 55

2. Flooding

	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability No cover	3	8	24	24
Subsurface flows	-	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	52	114

Subscore (100 x factor score subtotal/maximum score subtotal) 46

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 55

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	~~34~~
Waste Characteristics	~~54~~
Pathways	55
Total 143 divided by 3 =	~~48~~ Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

48 x 1.0 = **48**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108

Subscore (100 X factor score subtotal/maximum score subtotal) 39

2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	-	8	-	-
Direct access to ground water	0	8	0	24
		Subtotals	44	90

Subscore (100 x factor score subtotal/maximum score subtotal) 49

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 49

IV. WASTE MANAGEMENT PRACTICES

Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	31
Waste Characteristics	60
Pathways	49
Total 140 divided by 3 =	47
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

47 x 1.0 = **47**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108

Subscore (100 X factor score subtotal/maximum score subtotal) 39

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation Water added	3	6	18	18
Soil permeability	2	8	16	24
Subsurface flows	-	8	-	-
Direct access to ground water	0	8	0	24
		Subtotals	50	90

Subscore (100 x factor score subtotal/maximum score subtotal) 56

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 56

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	31
Waste Characteristics	54
Pathways	56
Total 141 divided by 3 =	47
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

47 X 1.0 = 47

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	0	8	0	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108
		Subscore (100 X factor score subtotal/maximum score subtotal)		39

2. Flooding

	0	1	0	0
		Subscore (100 x factor score/3)		39

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability No cover	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	52	114
		Subscore (100 x factor score subtotal/maximum score subtotal)		46

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 46

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	31
Waste Characteristics	60
Pathways	46

Total 137 divided by 3 = 46 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

46 x 1.0 = **46**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 54

2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability No cover	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	52	114

Subscore (100 x factor score subtotal/maximum score subtotal) 46

C. Highest pathway subscore.

Enter the higheat subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 54

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics and pathways.

Receptors	31
Waste Characteristics	50
Pathways	54
Total 135 divided by 3 =	45

Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

45 x 1.0 = 45

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	50	108

Subscore (100 X factor score subtotal/maximum score subtotal) 46

2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	44	114

Subscore (100 x factor score subtotal/maximum score subtotal) 39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 46

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	51
Waste Characteristics	36
Pathways	46

Total 133 divided by 3 = 44 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

44 x 1.0 = **44**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108
		Subscore (100 X factor score subtotal/maximum score subtotal)		39

2. Flooding	0	1	0	3
		Subscore (100 x factor score/3)		0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation Water added	3	6	18	18
Soil permeability	2	8	16	24
Subsurface flows	-	8	-	-
Direct access to ground water	0	8	0	24
		Subtotals	50	90
		Subscore (100 x factor score subtotal/maximum score subtotal)		56

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 56

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	32
Waste Characteristics	40
Pathways	56
Total 128 divided by 3 =	43
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

43 x 1.0 = **43**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108

Subscore (100 X factor score subtotal/maximum score subtotal) 39

2. Flooding: 0 | 1 | 0 | 3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation Water added	3	6	18	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	50	114

Subscore (100 x factor score subtotal/maximum score subtotal) 44

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 44

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	31
Waste Characteristics	54
Pathways	44
Total 129 divided by 3 =	43

Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

43 x 1.0 = **43**

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	50	108
Subscore (100 X factor score subtotal/maximum score subtotal)				46

2. Flooding	0	1	0	3
Subscore (100 x factor score/3)				0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	-	8	0	24
Direct access to ground water	2	8	0	24
		Subtotals	44	114
Subscore (100 x factor score subtotal/maximum score subtotal)				39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 46

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	34
Waste Characteristics	40
Pathways	46

Total 120 divided by 3 = 40 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	2	6	12	18
Rainfall intensity	2	8	16	24
		Subtotals	52	108

Subscore (100 X factor score subtotal/maximum score subtotal) 48

2. Flooding

	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation Water added	3	6	18	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	C	24
		Subtotals	50	114

Subscore (100 x factor score subtotal/maximum score subtotal) 44

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 48

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	29
Waste Characteristics	30
Pathways	48

Total 107 divided by 3 = 36 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

36 x 1.0 = 36

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	1	8	8	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	42	108
	Subscore (100 X factor score subtotal/maximum score subtotal)			39

2. Flooding	0	1	0	3
	Subscore (100 x factor score/3)			0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	44	114
	Subscore (100 x factor score subtotal/maximum score subtotal)			39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 39

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	24
Waste Characteristics	40
Pathways	39

Total 103 divided by 3 = 34 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

34 x 1.0 = 34

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest surface water	0	8	0	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	34	108

Subscore (100 X factor score subtotal/maximum score subtotal) 31

2. Flooding

Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Depth to ground water	2	8	16	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	0	8	0	24
Direct access to ground wat	0	8	0	24
		Subtotals	44	114

Subscore (100 x factor score subtotal/maximum score subtotal) 39

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 39

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	31
Waste Characteristics	24
Pathways	39
Total 94 divided by 3 =	31
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

31 x 1.0 = **31**

Gross Total Score X Waste Management Practices Factor = Final Score

50 x 1.0 = 50

END

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